

35 CENTS

CONSTRUCTION

METHODS AND EQUIPMENT

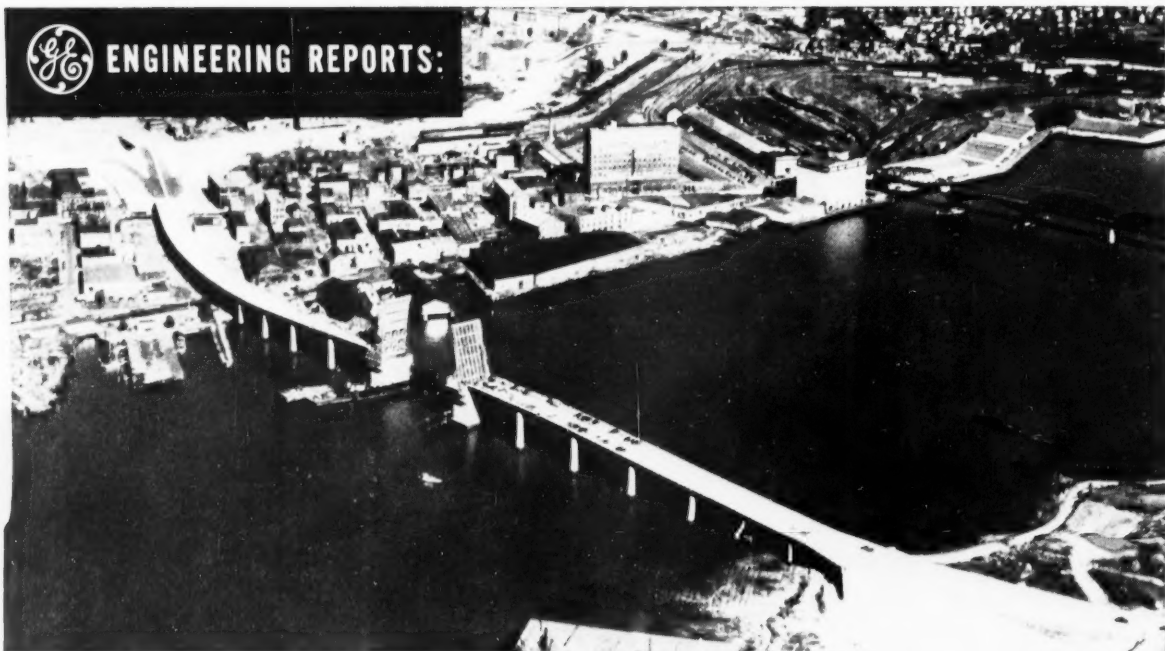
March 1953



A MCGRAW-HILL PUBLICATION



ENGINEERING REPORTS:



MOTORISTS SAVE 10 TO 30 MINUTES crossing from Norfolk to Portsmouth via the new G-E equipped bridge and tunnel.

Bridge is 4-lane, 2135 ft between abutments. Bascule span is of the double-leaf, rolling-lift type with leaves each 90 ft long.

Bridge's drive system helps speed 29,000 cars per day

G-E equipment at Portsmouth - Norfolk Bridge gives fast movement, positive control of leaves

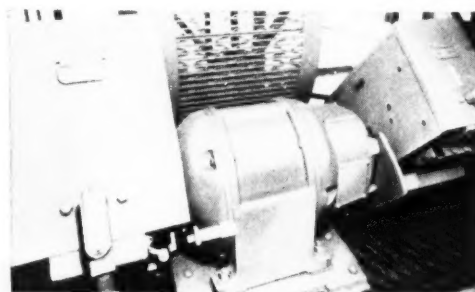
The new 4 lane bascule bridge across the Elizabeth River at Norfolk, Va. part of a combined bridge and tunnel project built for the Portsmouth Norfolk Bridge Tunnel Commission is currently handling over 29,000 vehicles per day. Ability to handle this heavy traffic flow is due in part to electric equipment supplied and co-ordinated by General Electric.

In helping to develop the bridge's drive system, G-E engineers worked closely with J. E. Greiner Co., consulting engineers, Tidewater Construction Corp., engineers and contractors, and Tuck and Kendall Inc., electrical contractor. Result of this co-operation: a simple, dependable drive system that expedites traffic because it is easy to operate and provides positive-action control of bridge leaves for fast movement and smooth, safe seating.

This is one more example of how G-E engineers can help your engineers or consultants on electric equipment for heavy construction projects. Contact your local G-E Apparatus Sales Office early in the planning stage. General Electric Co., Schenectady 5, New York. 664-26



POSITIVE-ACTION CONTROL of span motors is centered in this G-E operator's desk. Fine-scale selsyn dial pinpoints position of each leaf during seating.



EACH LEAF IS MOVED by 2 G-E 25-hp motors (one shown). G-E motor control center, operated from desk, controls these and tail locks, gates, barriers.

Engineered Electrical Systems for Heavy Construction

GENERAL  **ELECTRIC**

B.F. Goodrich



New Earth-Mover tires haul giant loads, yet float over sandy ground

FRANK T. HICKEY, INC., of Los Angeles is an earth-moving firm operating throughout southern California. The unit above is hauling 24 tons of sand fill for troop barracks at Fort Ord.

Plowing through sandy soil under a 24-ton payload, plus the weight of the equipment, would cause most tires to bog down and become useless. That's why this contractor mounts his machinery on new B. F. Goodrich All-Nylon 65" Special Earth-Mover tires. They are specifically designed to pull through loose, shifting soils without sinking in.

Special Earth-Mover tires do this because they operate at low air pres-

sures that give greater flexibility. The tires conform more to the soil, rolling over it rather than digging into it. The cord body of the tire is made of nylon which stands the strain of this flexing action better than other materials.

Because extra-high cleats often have a tendency to churn the ground, Special Earth-Mover cleats are low and shallow. They provide positive traction, yet will not dig in and cause the tire to flounder. Your equipment stays on top of the earth and on schedule.

If your off-the-road job calls for work in soft, sandy ground, you can get top traction and flotation by using new B. F. Goodrich All-Nylon Special

Earth-Mover tires. They are the result of two years' development and testing by a noted off-the-road equipment manufacturer.

B. F. Goodrich makes a complete line of tires that cut costs and save time on all types of off-the-road service. See your retailer—he's listed under Tires in the Yellow Pages of your phone book—or write *The B. F. Goodrich Company, Akron, Ohio.*



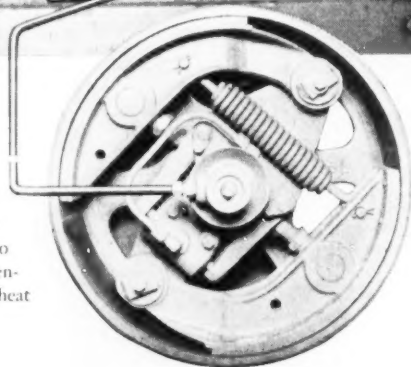
Specify B. F. Goodrich tires when ordering new equipment

Before you buy:

COMPARE CLUTCHES!



Speed-o-Matic Clutch shoes are actuated by perfectly controlled variable hydraulic pressure transmitted directly into the clutch. There are no mechanical linkages, no boosters. Clutch is self-compensating, automatically adjusts for heat and normal lining wear.



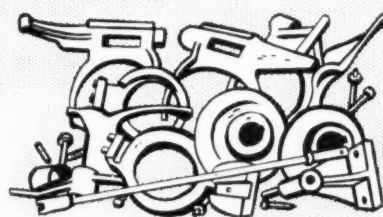
**Link-Belt Speeder's
hydraulic clutch needs
fewer adjustments
eliminates jerk, jump or lag**

THE Speed-o-Matic power-driven hydraulic controls and clutch eliminate mechanical clutch linkage. This results in unequalled ease and speed of operation . . . smooth, instantly responsive action. You get longer lining life, freedom from frequent attention and far less chance for clutch failure.

For details on the Speed-o-Matic clutch . . . information on the Link-Belt Speeder line of crawler, wheel or truck mounted shovel-cranes, write:

**LINK-BELT SPEEDER
CORPORATION**
Cedar Rapids, Iowa

13,109



Eliminates up to 150 parts — there are no worn bushings, pins, links or clutch toggles to put you "down."

LINK-BELT SPEEDER CORPORATION

BUILDERS OF A COMPLETE LINE OF CRAWLER, TRUCK AND
WHEEL-MOUNTED SHOVEL-CRANES

**FACTORY-TRAINED
DISTRIBUTOR SALES
AND SERVICE SPECIALISTS
...EVERYWHERE**



How many moving parts?

- In this particular rope construction there are 199 individual wires. Each is a carefully designed "moving part."
- Outside wires are one size. Inside wires are another size. Core and filler wires are still other sizes.
- Altogether, 8 different sizes of wire are used, and each has a specified strength, toughness and flexibility.
- Macwhyte has specialized in the manufacture of wire rope like this for over half a century.
- To assure highest quality, all stages of wire manufacture and rope fabrication are closely controlled.
- An exact "breathing space" between each wire is provided in order to increase flexibility.
- Each wire is protected with a film of lubricant that is force-fed *cold* during the fabricating.
- Since any piece of wire rope is a complicated piece of machinery, precision is as important in its manufacture as in the making of a fine watch.
- In designing and manufacturing its thousand and one wire ropes, Macwhyte exercises all the special care that assures long service and low cost to you. May our engineers recommend the right rope for *your* equipment?

Macwhyte 6x25F PRE-formed Monarch Whyte Strand Wire Rope with I. W. R. C.

MACWHYTE WIRE ROPE

THE RIGHT ROPE
FOR YOUR EQUIPMENT

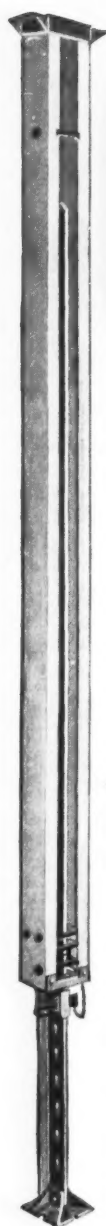
Ask for G-15 Handbook

1032



MACWHYTE COMPANY

2941 Fourteenth Avenue, Kenosha, Wis. Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal, Stainless Steel Wire Rope and Wire Rope Assemblies. Mill depots: New York • Pittsburgh • Chicago • St. Paul • Fort Worth • Portland • Seattle • San Francisco • Los Angeles • Distributors throughout U.S.A.



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☐ Shores ☐ Forms

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CONSTRUCTION

METHODS AND EQUIPMENT

Volume 35, Number 3

MARCH 1953

Established 1919

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March 1953

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What kind of tires can your jobs afford ?



THE kind that are specifically designed for your types of jobs and equipment. The kind that only great practical experience can build. The kind that are built *sparing nothing* to bring you the greatest traction, the most rugged durability, the longest wear.

In short, the kind of tires that will keep your jobs rolling regardless—and save you time and money!

No truly cost-wise operator can afford a

lesser tire—and that's why more tons, the world over, are hauled on Goodyears than on any other make!

It stands to reason that Goodyear, who has built more tires for more purposes than anyone else on earth—who has a vast practical experience matched by none, can help cut *your* operating costs, too!

Goodyear, Truck Tire Dept., Akron 16, Ohio.

**FOR EACH JOB,
THERE'S A COST-CUTTING
GOODYEAR TIRE!**



HARD ROCK LUG

For traction and toughness on tire-killing work.



HARD ROCK RIB

Front-wheel work—more to the Hard Rock Lug.



ROAD LUG

Best on-and-off road. Runs smoother, cooler on highway — takes the rap in the rough!

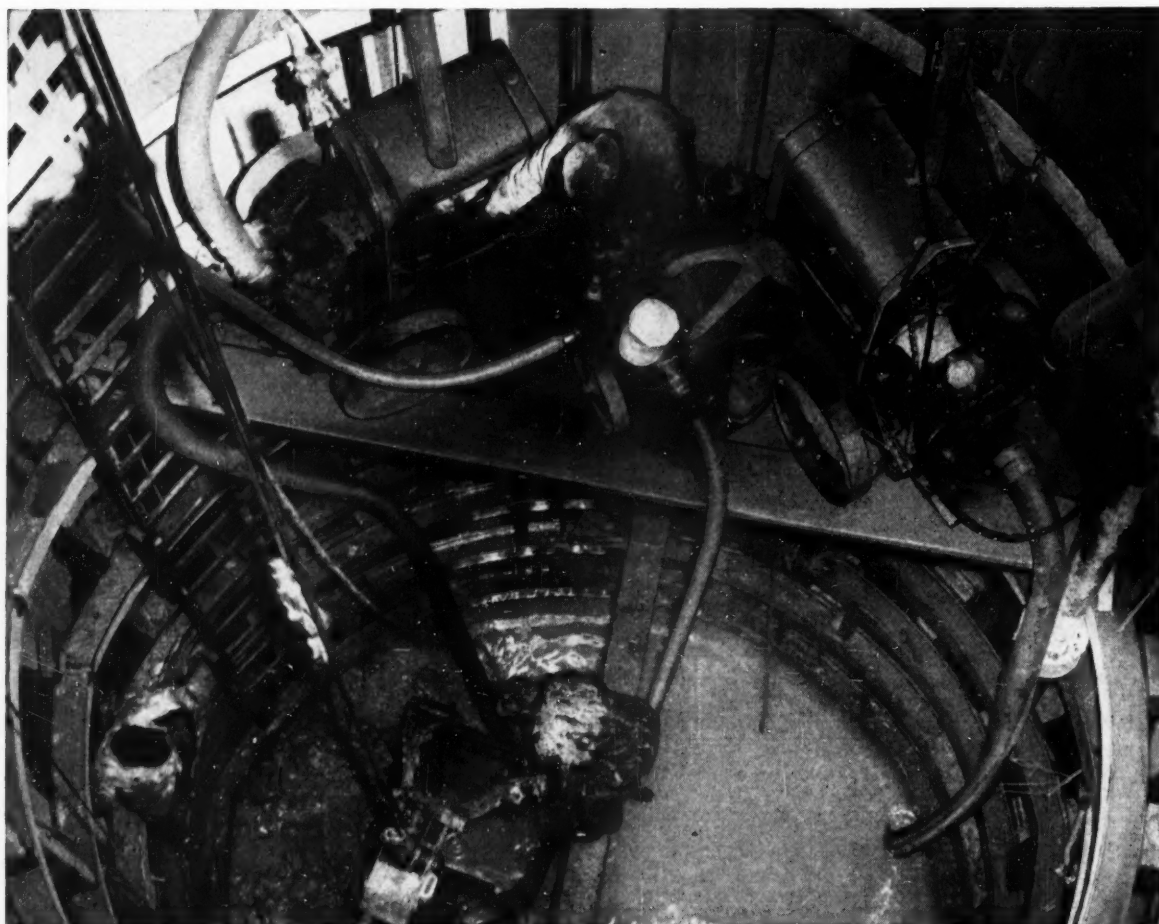
Road Lug—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

GOODYEAR

We think you'll like "THE GREATEST STORY EVER TOLD"—every Sunday—ABC Radio Network—THE GOODYEAR TELEVISION PLAYHOUSE—every other Sunday—NBC TV Network

Looking down caisson during construction of \$1,400,000 Buffalo, N.Y. High Level Bridge
Two Jaeger 6" pumps and one Jaeger 2" pump handle heavy inflow into 17 ft. diameter caisson, going to 50 ft. depth in riverbed. 25 of these caissons were used to sup-

port concrete piers, several up to 95 feet high, at river's edge. Additional caissons were sunk near an elevated railway and an auditorium, to protect their foundations. In many cases cement grouting was necessary — on a single caisson as many as 800 sacks of cement were used.



50 ft. deep in a pier hole you can bet your shirt on Jaeger pumps

Jaeger Pumps are built oversize with larger shells and impellers. They hold more priming water and are subject to less abrasive wear. These big pumps are designed with 2 independent simultaneous priming actions, the only positive self-lubricating seal and engines of the largest horsepower applicable. They deliver full volume at an easy 1200 rpm, prim-

ing at only 1400 rpm compared with up to 2000 rpm for ordinary pumps.

No vapor lock even when pulling high vacuum on long intake lines — sustained efficiency on non-stop pumping, and thousands of extra hours of service from both pumps and engines.

- Dewatering Pumps 2" to 10" with capacities of 10,000 to 240,000 gph.
- Pressure Pumps for pressures to 275 lbs.
- Pressure pumps 2" to 8" for supply work.
- Diaphragm pumps for sand and mud.
- Well point Systems

See your Jaeger distributor or send for catalog P-10

THE JAEGER MACHINE COMPANY

800 Dublin Avenue, Columbus 16, Ohio

COMPRESSORS • MIXERS • TRUCK MIXERS • PAVING MACHINES



*For the people whose business is **ROCK!***

The pictures on this page are typical of Northwest Shovels that are repeat orders in the hands of people whose business is Rock. Each one of these companies has tested Northwest machines continuously in their own rock. They have proved Northwest as a Rock Shovel. They have learned the value of the Northwest Dual Independent Crowd—the crowd that utilizes force most other shovels waste. They have found out what it means to have ease of operation without the complications of pumps, valves and other delicate mechanisms. They have seen the smoother operation and freedom from jerks and grabs characteristic of Northwest Uniform Pressure Swing Clutches. They know what the Cushion Clutch means with its ability to eliminate shock overloads before those overloads can do damage to the machinery. In short, they have proved Northwest advantages to be money makers worth having.

Now is the time to plan to be a Northwest Owner. Now is the time to check into and learn about Northwest. Why not talk to a Northwest Man and get the whole story?

NORTHWEST ENGINEERING COMPANY
1503 Field Building • 135 South LaSalle Street, Chicago 3, Illinois

NORTHWEST

SHOVELS • CRANES • DRAGLINES • PULLSHOVELS



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● SCORE 100% if your answer is: "The oil that's best suited to the operating conditions."

Air compressors work under various conditions of humidity, temperature, pressure, etc. There is no one oil that will assure top performance under all of them. That is why there is a *complete line* of Texaco air compressor oils — so you can be sure of getting the right oil whatever your operating conditions, whatever the size or type of your compressors.

For your rock drills, use *Texaco Rock Drill Lubricant EP*. This "extreme pressure" lubricant offers the best protection against wear, guards against rust whether your drills are running or idle. Result — longer drill life and lower maintenance costs.

Let a Texaco Lubrication Engineer help you step up efficiency and cut down maintenance costs. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, New York.

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on television
Tuesday nights.
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Saturday afternoons.



TEXACO



TEXACO SIMPLIFIED LUBRICATION PLAN

Save time and money with the Texaco Simplified Lubrication Plan. Handle all your major lubrication with only six Texaco Lubricants. Prevent confusion . . . keep equipment on the job . . . keep maintenance costs down. Ask your Texaco Lubrication Engineer for full details.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

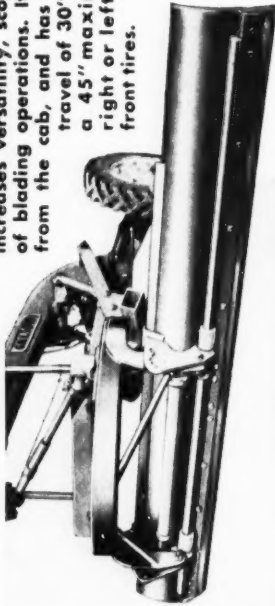
GALLION 503

Tandem Drive ECONOMY GRADER

*Gives you more
"BIG GRADER"
features than
any other!*

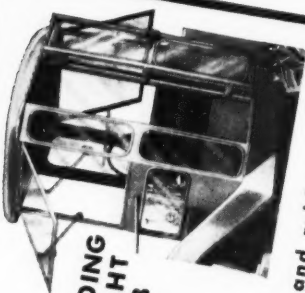


*** LEANING WHEELS**
Hydraulically operated from cab, provides "big grader" maneuverability, front on soft stability, and traction on sloping ground.



*** HYDRAULICALLY SHIFTABLE MOLDBOARD**
Increases versatility, scope, and ease of blading operations. It is operated from the cab, and has a horizontal travel of 30" — providing a 45" maximum reach, right or left, outside the front tires.

Other "special job" equipment available for increasing the usefulness of the Gallion 503 Grader includes Snow Plow, Loader, Windrow Eliminator, and Bulldozer.



STANDING HEIGHT CAB *

All steel and rubber-mounted safety glass. Operator can work in a standing position with ease and unequalled visibility of work. Full-height hinged doors. Top half of cab easily removed. Adjustable windshields front and rear.

GASOLINE OR DIESEL ENGINE
A 40 h.p. gasoline engine is standard equipment. A 36.7 h.p. diesel engine is available. *

PLUS THESE STANDARD FEATURES

Positive four-wheel tandem drive . . . extra-strong, box-type, high-arched frame . . . heavy 4" solid steel drawbar with heavy-duty ball-and-socket connection to head block . . . extra-large hydraulic cylinders and direct drive hydraulic pump . . . 4 forward speeds 2.3 to 20.4 m.p.h. and high reverse of 4.3 m.p.h. . . rugged high-clearance front axle . . . weight — 8,720 lbs., blade pressure 4,975 lbs. — both without extras.

* FRONT SCARIFIER

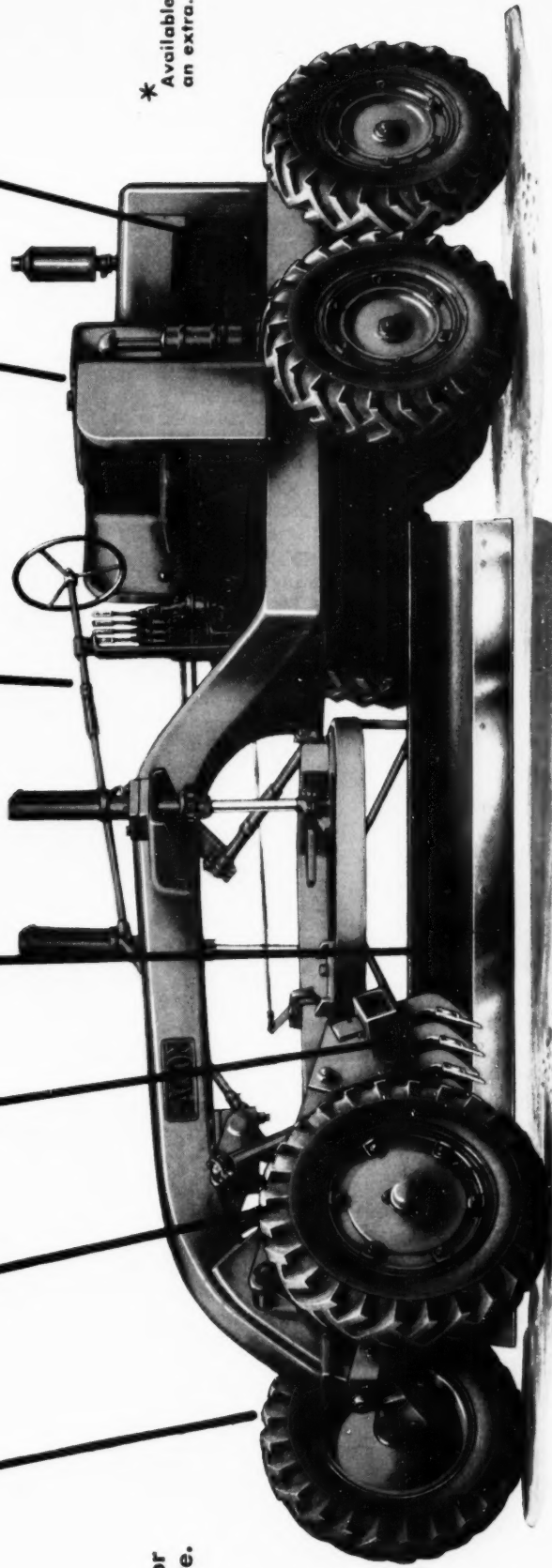
"V"-type hydraulic scarifier placed in the same position as on same of graders. Completely visible from cab when in use. Downward pressure causes no loss of traction by the tandem drive wheels. Replaceable points.

LARGE SIZE FRONT TIRES

Size 6.00-20 front tires are standard. Two larger sizes (7.50-20 or 8.25-20) available. *

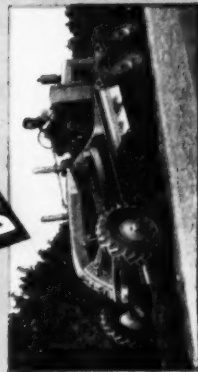
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literature.

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an extra.



Gets Jobs Done in "BIG GRADER" Style!

DITCHING



GRADING



SCAFFLING



SLOPING



A Thrifty Buy

With the GALION 503 you can put your road and street maintenance program in high gear — and do it without straining the budget!

On new construction it will save thousands of dollars in investment and operating costs over the costs with heavier graders.

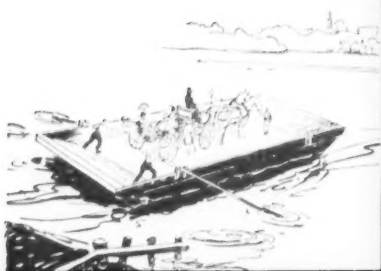
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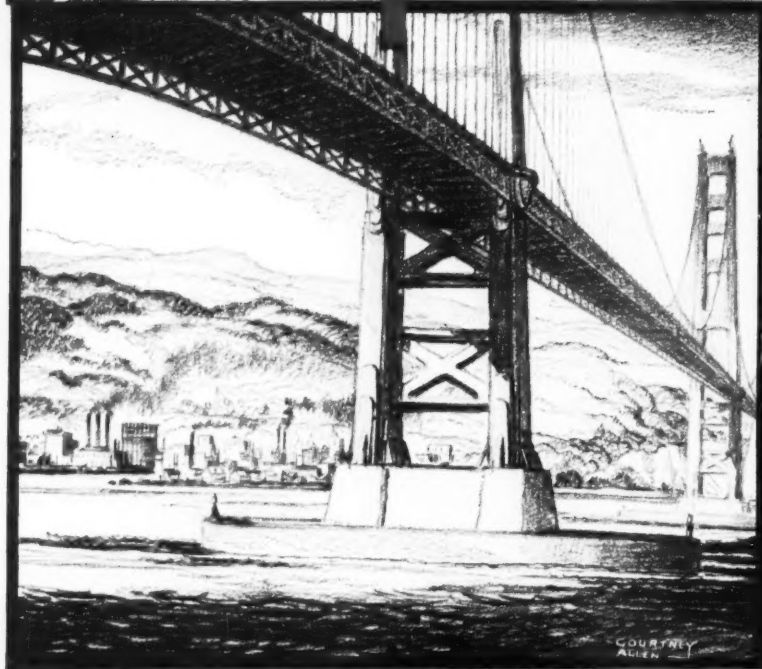
THE GALION IRON WORKS & MANUFACTURING COMPANY

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**The difference
is more
than meets
the eye**




Modern bridges do *more* than replace the old-fashioned ferry. They speed transportation and commerce by opening the way to new markets. They establish new lines of communication, overcome obstacles to progress and bind the nation into a closer unity. These are the real accomplishments of America's great construction industry.

The Aetna Casualty & Surety Company — through its nationwide bonding organization — is proud to have worked with so many contractors on countless projects that serve the nation better. To serve you better, the Aetna has constantly expanded and improved its bonding facilities. That is why you can always count on Aetna for prompt, informed, efficient service. That is why so many contractors bond with Aetna — always.

No job too big--no job too small

AETNA CASUALTY AND SURETY COMPANY

AFFILIATED COMPANIES: AETNA LIFE INSURANCE COMPANY
AUTOMOBILE INSURANCE COMPANY • STANDARD FIRE INSURANCE COMPANY
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★ JOB TALK ★

Safety With Explosives

Continued from p. 30 February issue

29. DON'T drill, bore or pick out a charge of explosives that has misfired. Misfires should be handled only by a competent and experienced man.
30. DON'T abandon any explosives. Dispose of or destroy them in strict accordance with the methods recommended by the manufacturer.
31. DON'T store cases of dynamite so that the cartridges stand on end.
32. DON'T leave dynamite, black blasting powder, or pellet powder in a field or any place where livestock can get at them.
33. DON'T take surplus quantities of permissible dynamite, black blasting powder, or pellet powder into a mine at any one time. These explosives deteriorate rapidly in a damp atmosphere.
34. DON'T use black blasting powder or pellet powder with permissible explosives or dynamite, nor dynamite with permissible explosives, in the same bore hole in a coal mine.

DONT!



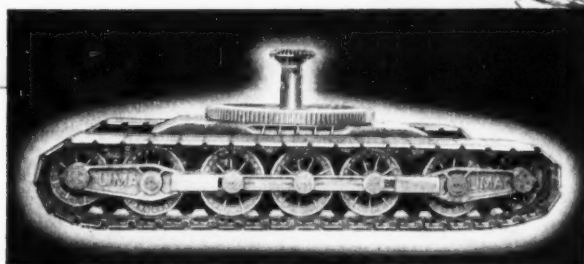
35. DON'T tamp pellet powder in a bore hole hard enough to crush the pellets, because of danger of premature explosion.
36. DON'T store blasting caps or electric blasting caps in the same box, container, or magazine with other explosives.
37. DON'T leave blasting caps or electric blasting caps exposed to the direct rays of the sun.
38. DON'T insert a wire, a nail, or any other implement into the

(Continued on page 28)



LIMA

SHOVELS • CRANES
DRAGLINES • PULL-SHOVELS



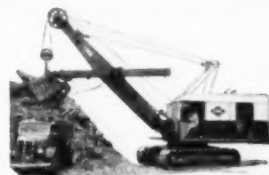
The Right Footing to Get There when the Going's Tough

When the snow is soft and deep, the smart sportsman doesn't bog down trying to buck it. He straps on his snow shoes—and the increased bearing area lets him go up and over the drifts.

It makes equally good sense to buy a shovel, crane or dragline that's built to ride over *not through* the soft spots—a LIMA, of course.

The crawlers on a LIMA are long and wide to give ample stability. Slightly elevated at the front to give a sled runner effect—self-cleaning—the LIMA crawler takes the tough spots right in stride.

So, when you're looking for equipment with greater working range—that will operate in the bad spots as well as the good ones—call your nearest LIMA Sales Office or Distributor. You'll find there are many other features—air actuated clutches, wide drums, anti-friction bearings throughout, etc.—that will help you set new performance records.



LIMA SHOVELS are available in capacities from $\frac{3}{4}$ to 6 yards.

LIMA CRANES are available in sizes to 110 tons capacity.

LIMA DRAGLINES are available in variable capacities to suit specific needs.

Wheel or truck mounting is available on machines of $\frac{3}{4}$ and $1\frac{1}{2}$ yards capacity.



LIMA
SHOVELS • CRANES
DRAGLINES • PULL-SHOVELS



BALDWIN-LIMA-HAMILTON CORPORATION
Construction Equipment Division
LIMA, OHIO, U.S.A.

Construction Equipment Division



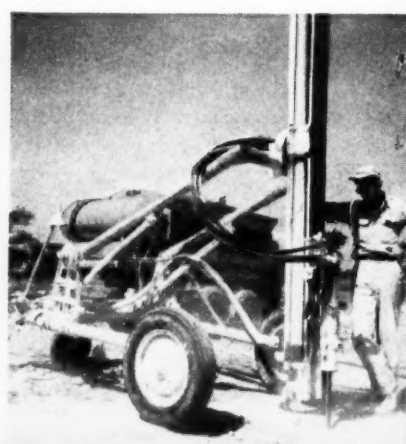
Le Roi gives you more for your money!

MORE AIR POWER! MORE FOOTAGE! MORE PROFITS!

Le Roi-CLEVELAND Sinkers are available in sizes from 18 to 80 lbs., with advantages you want. They use less air. They're easy to handle—operators don't tire easily. And they have what it takes to drill more feet per shift: Strong rotation. Powerful blow. High drilling speed.

Tractair is a combination 35-hp tractor and 105-cfm compressor that takes air power anywhere. Here, it operates two Le Roi-CLEVELAND backfill tampers. Can also be used for breaking, drilling — and, when equipped with front-end loader, for digging, loading, lifting, backfilling, snow-plowing, etc. This way, Tractair cuts costs and saves you the extra expense of special equipment.

Le Roi-CLEVELAND DR30 Wagon Drill puts deep holes down faster, with less air, than any other wagon drill available. Uses 4" bore Le Roi-CLEVELAND Drifter. Has strong rotation, powerful hole-cleaning ability, and high drilling speed with big bits. For shallow holes, the lightweight Le Roi-CLEVELAND DR34 is available.



Get air jobs done faster!

with Le Roi Airmaster Compressors and Le Roi-CLEVELAND Air Tools

There are 9 sizes of Airmasters — and 14 models—ranging from 60 cfm to 600 cfm. A 600-cfm diesel unit is shown here. It's got the capacity to operate two deep-hole wagon drills with plenty of air to spare for other tools.

Every Airmaster is powered by a heavy-duty Le Roi engine designed especially for compressor service.

Le Roi-CLEVELAND Paving Breakers are available in sizes from 18 to 80 lbs. They really pack a wallop—make short work of breaking up the hardest concrete. Protective air cushion in front end assures long life. Well balanced for easy handling. Operators like them — and get more done.

YOU make the most of air power—speed your work and keep costs down — when you team up Le Roi Airmaster Compressors and Le Roi-CLEVELAND Air Tools. Here's why:

First of all, a Le Roi Airmaster gives you more air capacity for less money. You can get an Airmaster that's *exactly right* for size — one that's not too big or too little for the job to be done — one that lets you do the most work at the least cost. That's because Le Roi has the industry's widest range of sizes to choose from.

You're ahead other ways, too: Airmaster's full-pressure system delivers *all*

the air you call for, *when* you call for it. Conservative rating of the Airmaster engine provides ample power reserve — for lower fuel consumption, less maintenance, lower operating costs. Magneto ignition gives you quick, easy starting — saves time — lets you get going faster.

Now, the best way to use the low-cost air produced by Airmaster is to let it power Le Roi-CLEVELAND Air Tools. They're built to really take punishment — and to break more pavement, dig more clay, drill more rock, tamp more fill.

Enjoy Le Roi air-power advantages. Use Le Roi Airmaster and Le Roi-CLEVELAND Air Tools on your next job — and watch costs drop. See your Le Roi distributor. Write for latest bulletins.

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Rock Drills

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Engines . . .



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counts more than ever...

and it's yours with



excavators

Speed, smooth operation and unmatched ability to take tough going have made Bucyrus-Erie a favorite with earth-moving men everywhere. And all these qualities can be applied to full advantage on every job because a Bucyrus-Erie operator is really master of his machine.

First, he has plenty of space to move freely and comfortably . . . with full visibility of his work at all times. Control levers are grouped within easy reach, with lever throws short enough for convenience . . . but long enough to give the operator accurate "feel." Big, slow speed clutches and brakes respond smoothly, yet quickly to give him constant, direct control of the load every moment of the work cycle.

With direct-action control, it's easy for operators to keep up a steady, production-building pace from the beginning of the shift to the end. If that's the kind of performance you'd like on *your* job, standardize on Bucyrus-Erie.

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Save time...
Save money...
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Hydrocrane

The compact, truck-mounted Hydrocrane handles an almost endless variety of jobs efficiently, at low cost. Full hydraulic control . . . pin-point accuracy . . . telescoping boom . . . easily set, hydraulically operated outriggers . . . and it's readily convertible in the field to dragshovel front-end, called Hydrohoe.



It's Your Business . . .

Highway Contracts Coming Up Top \$2.2 Billion

CONTRACTORS . . . get set for a big highway year.

Construction contracts budgeted for 1953 by 44 states, the District of Columbia and 7 Turnpike Authorities are up 44% above the record volume in 1952. But most of this gain is in toll roads. Activity will be up 370% above 1952 on these super highways. The states are scheduling 9% more contracts on their larger free system of roads and bridges. Budgets in to date add up to \$1.5 billion on the free system, \$700 million for toll roads, scheduled for awards this year.

Controls are off if you can find somebody who will sell. The outlook is generally good for supply of materials and equipment, but you'll have to rustle for good men. Engineers are critically short in 26 states and moderately short in 19. Shortages are expected to continue in 39 states. Highway labor is critically short in 4 states, moderately short in 19, but in comfortable supply in 15 states and in good supply in 8. Labor shortages are expected to continue in 20 states, but 6 expect the supply to improve and 21 expect it to be adequate.

Cement is critically short in Ohio and moderately short now in 11 states, but only 8 states expect shortages to continue in 1953.

Steel shortages are expected by 15 states in structural shapes and by 6 states in reinforcing, but 28 states look for improvement in supplies of structurals and 19 states expect reinforcing supplies to improve.

Moderate equipment shortages are reported by 10 states, but only 4 expect improved supplies and 33 states expect adequate supplies for work budgeted.

How the Economy Directive Affects Federal Construction

The Eisenhower-Dodge economy directive is going to mean a one- to two-month slowdown in awarding the bulk of federal construction contracts.

Military and Naval works make up the biggest part of the government's award schedule. Secretary of Defense Charles E. Wilson lost no time in putting out an order to all three services to award no contracts after February 7 until cleared by the Secretary. The order means that projects not yet placed under contract must be submitted to construction headquarters of the services in Washington.

It will be up to the services to show that each project is essential. This requirement takes precedence over a second test: That project costs are in line with the economy order. Where two services are involved, as when the Army Engineers build for the Air Force, it will take more time and paperwork to justify a job.

The military services wanted to sign construction contracts at a rate of \$200 million to \$300 million a month in February, March and April. Awards may be set back \$500 million, but the effect need not be disastrous. Advertising of proposals and taking of bids are going forward without interruption. Once a project is cleared by Wilson, it can be awarded to the low bidder. For the year, the gross total of awards may be no less than it would have been without the freeze.

At press time no similar drastic measure had been taken on civil public works. The Secretary of the Army had issued no order to freeze awards on flood control and navigation projects of the Corps of Engineers. Those jobs are being reviewed closely by the Engineers themselves.

For Interior agencies like the Reclamation Bureau, the effect was equally mild. Secretary Douglas McKay on February 13 ordered field offices to submit to him for clearance all contract awards over \$10,000. Up to that time, regional offices of the Reclamation Bureau, for example, had been able to make awards up to \$200,000. But the new Interior directive is expected to cause little delay in awarding contracts.

Longer time—probably two weeks or more—will be required to clear contracts for new starts. Here, the agency has to prove that the project is essential. But new starts are few in the construction schedule of the Reclamation Bureau, to cite Interior's biggest construction agency.

In addition to checking new contract awards, construction agencies of the government are reviewing projects under construction to determine whether money could be saved and the best interests of the nation served by stopping work on any of them. Defense Secretary Wilson put out the strictest directive on this point. He asked for data on all projects that were less than 20% completed February 10.

No work is to be stopped while the projects are reviewed. And you can bet none will be stopped after the review has been completed. Cancelling a contract would cost the government plenty. The contractor would have unshakable grounds for damages.

The economy order does not apply to state and local federal-aid programs, for highways, hospitals, schools, community facilities and low-rent public housing.

SOME BIG CONTRACT AWARDS OF THE MONTH

Turner Const. Co., 1500 Walnut St., Phila., Pa. Garage, Walnut, 18 and 19 Sts., for Phila. Parking Authority, Packard Bldg., Phila., Pa., \$809,000.

Bechtel Corp., 220 Bush St., San Francisco, Calif. Nickel smelter plant for Hanna Coal & Ore Corp. and Hanna Nickel Smelting Co., Riddell, Ore., \$20,000,000.

Hendrickson Bros., 63 N. Central Ave., Valley Stream, N. Y., lateral sewers for Board of Supervisors,

Nassau Co., Old Court House, Minicola, N. Y., \$1,799,335.

M. W. Kellogg Co., 225 Broadway, New York 7. 60-bbl-per-day crude distillation unit at Linden, N. J. for Esso Standard Oil Co., 15 W. 51st St., New York 9. \$6-7,000,000.

Booth & Flinn Co., 1942 Forbes St., and **Ferguson & Edmondson Co.**, Keystone Bldg., Pittsburgh, Pa., 1,000,000-kw Kyger Creek power plant, Cheshire, Ohio, for Ohio Val-

ley Electric Co., 30 Church St., New York 8. \$6,500,000.

Sam W. Emerson Co., 1836 Euclid Ave., Cleveland, Ohio shopping center, including large department store on 80-acre site, Elyria, Ohio, for M. O'Neil Co., 226 S. Main St., Akron, Ohio and Weinberg and Teare, Citizens Bldg., Cleveland. \$4,500,000.

Sollitt Construction Co., 301 Columbia St., South Bend 24, Ind. 1,200,000-
(Continued on page 20)

Tough Going-



but DW20s maintain schedule at Old Hickory

The Old Hickory Lock and Dam project, in Tennessee, calls for moving 1,700,000 yards of heavy, fat clay. Roads are spongy, grades are steep. But H. N. Rodgers & Sons Co., of Memphis, have kept up to schedule.

The big reason is their use of Caterpillar DW20 Tractors and No. 20 Wagons. With 225 honest horsepower available at the flywheel, these big yellow wheel tractors can pull through heavy clay cuts without excessive engine strain, and they travel 26 mph. on the haul.

The No. 20 Wagon is a perfectly matched unit, with 20-cu.-yd. heaped capacity. That means up to 25 tons

Big loads in tough going are easy for this Cat DW20-No. 20 unit, one of 8 on the job at Old Hickory. The Lima dragline is powered by a Caterpillar D17000 Engine.

in heavy material. The wagon is an easy target to hit with the shovel, and positive controls make possible either instantaneous or windrow dumping.

The Rodgers firm has been using Caterpillar equipment for 23 years, and the fact that 90% of their present machines are Cats shows what they think of them.

Your Caterpillar Dealer will gladly demonstrate the DW20-No. 20 team for you in any kind of hauling you choose. And he backs it with genuine Caterpillar parts and service—the only kind that gives you genuine Caterpillar performance. See him today!

CATERPILLAR, PEORIA, ILLINOIS

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**DIESEL ENGINES
TRACTORS • MOTOR GRADERS
EARTHMOVING EQUIPMENT**

A profitable tool
with many uses!

BARCO *Gasoline* HAMMER

ONE MAN OPERATION!
NO COMPRESSOR NEEDED

HERE'S why owners of the *improved* Barco Gasoline Hammer are enthusiastically acclaiming it as "A Profitable Tool With Many Uses!"

- New ignition system—quick, easy starting; trouble-free.
- Quick cable disconnect at handle. New handle design; switch convenient to operator's thumb.
- More portable than ever! Easily taken to any location by car, truck, or light plane.
- Versatile! A handy tool for Pavement Breaking . . . Cutting . . . Digging . . . Rock Drilling . . . Frost Breaking . . . Rod Driving. Ideal for general utility, standby, and emergency service.

● Economical! Low first cost, low operating expense, low maintenance expense. Quickly pays for itself.

● Powerful, rugged. Up to 1550 strokes per minute.

ASK FOR A DEMONSTRATION — See for yourself—ask for our nearest distributor to give you a demonstration.

Send for a copy of this interesting new Bulletin No. 613 — "BARCO GASOLINE HAMMERS".



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GASOLINE HAMMERS AND RAMMERS



PAVEMENT BREAKING — Used by municipalities and utilities to make street openings, break curbs, and cut trenches.



ASPHALT CUTTING — An easy, fast job with a Barco Hammer.



EMERGENCY WORK — Day or night, one man can take tool to any location.

IT'S YOUR BUSINESS . . .

Continued from page 18

Some Big Jobs of the Month

kw Clifty Creek power plant near Madison, Ind., for Indiana-Kentucky Electric Co., 30 Church St., New York 8, \$8,000,000.

C. H. Leavell Co., 1900 Wyoming St., El Paso, Tex., airmen's dormitories, mess and administration buildings, Lincoln Air Force Base for U. S. Engineers, 1709 Jackson St., Omaha, \$4,586,347.

Baldwin Co., Wallace Bldg., Little Rock, Ark. 100,000 sq ft main section aluminum fabrications plant, Jones Mill, Ark., for General Motors Corp., Fabricast Div., Bedford, Ind., \$3,000,000.

Turner Construction Co., 105 W. Adams St., Chicago 3, Ill. 10-story office building Wacker Dr. and Randolph St. for John W. Galbreath & Co., 42 E. Gay St., Columbus, Ohio, \$5,000,000.

Kansas City Bridge Co., 928 Broadway and **Massman Const. Co.**, 20 W. 9th St., Kansas City, Mo. lift railway bridge over Columbia River at Pasco, Wash., for Northern Pacific Ry. Co., St. Paul, Minn., \$4,000,000.

Rust Engineering Co., 575 Sixth Ave., Pittsburgh, Pa., facilities at Knolls Atomic Power Laboratory, West Milton, N. Y., for U. S. Atomic Energy Comm., Schenectady, \$3,365,000.

Daniel Construction Co., P. O. Box 2087, Greenville, S. C., ward buildings at South Carolina State Hospital, Columbia, S. C., for State Mental Health Comm., State Capitol, Columbia, S. C., \$2,227,000.

McManus Framing Co., 40 Federal Hy, Boca Raton, Fla. 1,000 residences for Florida Boca Raton Housing Assn., Boca Raton, \$8,000,000.

Nello L. Teer Co., Box 1131, Durham, N. C., grading, draining 3 mi West Virginia Turnpike, Kanawha Co., \$2,952,436.

Paul Smith Const. Co., 3103 N. W. 20th St., Miami, Fla., sewage treatment plant on Virginia Key, \$9,217,563.

P. J. Walker Co., 3900 Whiteside Ave., Los Angeles, Calif. Brewery plant near Van Nuys, Calif., for Joseph I. Schlitz Brewing Co., Milwaukee, \$20,000,000.

Mississippi Valley Structural Steel Co., 3117 Big Bend Rd., St. Louis, Mo., furnishing, erecting structural steel, Clifty Creek powerhouse, Madison, Ind., for Indiana-Kentucky Electric Co., \$5,000,000.

EMERGENCY!



THE AIRCO ACETYLENE FLARE floods your operations-after-dark with a wide, brilliant field of light* . . . and acts as an ideal beacon in emergencies.

This low-cost unit is readily adaptable for night-time bridge and track repairs, flood conditions, highway and construction jobs — wherever light is vital! Each flare is equipped with a sturdy windscreen — for dependable illumination *when you need it . . . as long as you need it.*

Developed in part by a prominent railroad system, hundreds are now in active service. If there are times when your operations require a reliable source of light . . . when power is unavailable . . . contact your nearest Airco office!

* With the flare placed 8 feet above the ground, you can read fine print in a newspaper — 75 feet away!



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GULF PRODUCTS *and* **FINE SERVICE**

keep equipment rolling

on Virginia Sewage Treatment Project



Thompson-Starrett Company, Inc., Arlington, Va., is building a large sewage treatment plant for that city. The photo shows progress of the work in October 1952. The modern equipment on the job is lubricated and fueled with Gulf products.

ON all types of construction projects, Gulf lubricants and fuels play an important part in keeping equipment on the job—and operating efficiently.

Leading contractors find that it is good profit insurance, as well as real economy, to use Gulf products. Always of the same uniform high quality, they work as a team to help them make more hauls, with fewer overhauls and lower maintenance costs.

Write, wire, or phone your nearest Gulf office

and arrange to use Gulf products on your next job. They are quickly available to you through more than 1400 warehouses in 31 states from Maine to New Mexico.



**LOOK
JOE!**

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SALES EVERYWHERE
BLADES

**HERE'S WHY...
"4 OUT OF 5"
BUY CLIPPER**

- CUT FASTER
- LAST LONGER
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Clipper Superior Blades
are guaranteed to...
"Provide the Fastest Cut
... at the Lowest Cost!"

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ONE OF 5 MODELS
GAS OR ELECTRIC
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Blades are manufac-
tured under rigid con-
trol... assuring con-
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are guaranteed peak
performance... at
the lowest possible
cost with every blade.

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Your guarantee of the finest, fastest, most
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is the familiar Clipper Trade Mark on
a Wet Abrasive — Dry Abrasive —
"CBR" (Break-Resistant) — or a
Diamond Blade.

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Experience Behind
Genuine**

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The unqualified Clipper
guarantee of satisfaction
is backed by nearly 20
years of world-wide expe-
rience, the ability to select
the finest materials and
the "know-how" to put
them together.



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Any masonry material can
be cut in seconds with
either a "WET" or "DRY"
specification. New type
Clipper Abrasive Blades
approach the cutting speed
of diamonds.

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No other means of mason-
ry or concrete cutting can
equal the cutting speed of
a Clipper Diamond Blade.
Only Clipper has every
necessary specification to
do your cutting job.

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Drop — Bend — Twist —
they're virtually unbreak-
able! 50% to 100% longer
blade life on softer ranges
of materials. Ideal for
both masonry and hand
power saws.

LOOK for the
BRIGHT ORANGE
COLOR and the
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Faster Cutting—Economical
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Why guess about performance? Why exper-
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can tell you exactly which Clipper blade will
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cut at the lowest cost
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When your operating margin is narrow...

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Continuoflo **EQUIPMENT**

makes profit more certain

Evans picks Pioneer equipment for new Texas mine

● Stanley Evans, veteran dirt mover and road builder, is now mining limonite. East of Linden, Texas, in the north basin of the East Texas Field, Evans has built a remarkably efficient operation. Output quickly rose to 150 tons per hour... and is expected to increase.

In designing his beneficiation plant, Evans relied almost exclusively on PIONEER equipment. From his experience in the construction business, he knew about the PIONEER EDGE... the extra capacity, sta-

mina, and operating efficiency built into all PIONEER equipment.

He knew too, that up on Minnesota's famous Mesabi range, he could find more PIONEER feeders, jaw crushers, and complete washing plants, than all other makes combined.

So his decision was easy... and today, like so many other mine operators who have the PIONEER EDGE on their side, Evans is producing extra tons at surprisingly low cost.



These Pioneer Units Keep Costs Low for Evans

Beneficiation plant at the S. E. Evans Construction Company mine (shown above) was designed by George Hawkins, Evans production manager. It includes the following Pioneer units.

- 5' x 12' MESABI VIBRATING SCREEN
- 30" x 42" JAW CRUSHER
- 3 4' x 12' 3-DECK VIBRATING SCREENS
- 4' x 8' VIBRATING SCREEN
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| <input type="checkbox"/> ROLL CRUSHERS | <input type="checkbox"/> BITUMINOUS PLANTS | <input type="checkbox"/> VIBRATING SCREENS |
| <input type="checkbox"/> ROCK PLANTS | <input type="checkbox"/> APRON FEEDERS | <input type="checkbox"/> BUZZER SCREENS (LIGHT DUTY) |
| <input type="checkbox"/> GRAVEL PLANTS | <input type="checkbox"/> GROUND FEEDERS | <input type="checkbox"/> CONTINU-FLO CONVEYORS |

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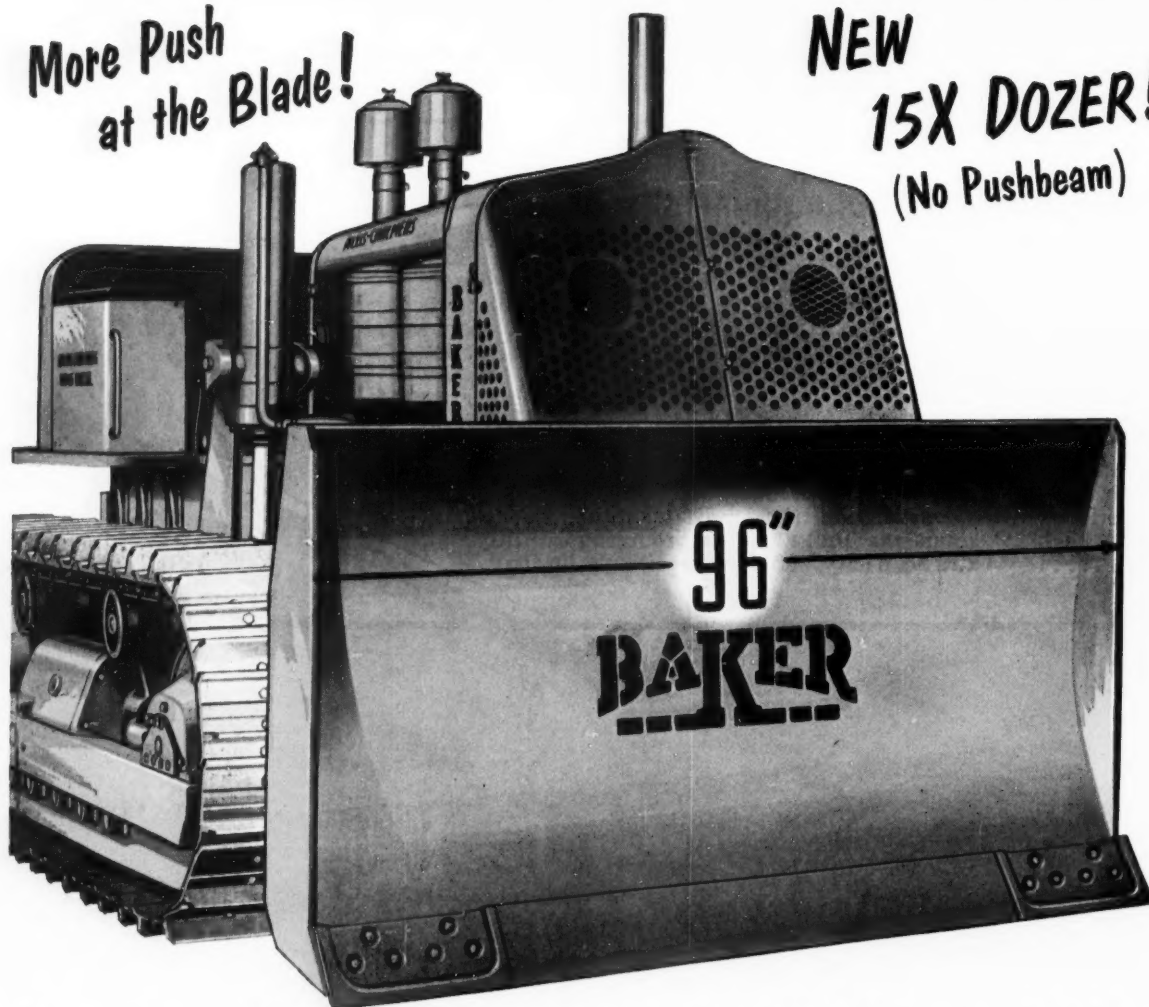
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**More Push
at the Blade!**

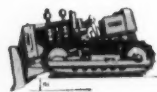
**NEW
15X DOZER!**
(No Pushbeam)



More Powerful, More Rugged, but Still Highway Width!



Higher, Faster Lift—full 39½ inches above ground. Unusually good center of gravity affords excellent leverage and maximum traction with blade in any position.



Deeper, Faster Bite—full 15½ inch drop below ground. Positive down pressure, elimination of "bounce", and steeper approach angle puts—and keeps—blade down deep.

Baker's revolutionary, no pushbeam, highway width 9X dozer proved that *it could be done!* Now . . . Baker presents a *bigger, more powerful* edition—the Baker 15X—combining the famous Baker "roll action" 96 inch-wide blade with the 109 drawbar hp of A-C's HD-15.

The successful result of painstaking design and exhaustive testing, the big-capacity 15X utilizes Baker's specially engineered hydraulic lifting mechanism to direct every ounce of horsepower to where it counts most—*at the dozer blade!*

Now! . . . ask your Baker, Allis-Chalmers dealer for complete information about this completely new Baker 15X.

THE BAKER MANUFACTURING COMPANY, SPRINGFIELD, ILLINOIS



Check These Features!

- Legal Highway Portability—only 96" wide • Big Yardage Mold-board • More Horsepower at the Blade • Sure Footed—greater track oscillation • Working Center of Gravity • "Operator-Ease" Control • Design for Easy Servicing • Lighter—Less Cost.

Always Look to Baker for the Next Advancement—First

Dozens of Uses • Thousands of Users

Prove Ability, Versatility of the Model D

The thousands of satisfied owners are still finding new uses for the able and versatile Allis-Chalmers Model D Grader. It has proved again and again that it has the power and capacity to do outstanding work on both construction and maintenance.

Usefulness of the Model D is multiplied by several easily mounted attachments: hydraulically controlled rear-end loader, shoulder maintainer that is interchangeable with the loader, scarifier, both V-type and blade snowplows.

MORE POWER, MANY FEATURES, LOW COST

For even greater performance ability, the Model D's power has been boosted to 40 brake hp. With its added power and many big-grader features such as tandem drive, ROLL-AWAY Moldboard, tubular frame and hydraulic blade lift — the Model D's original cost still is but one-third that of a large grader. Operating costs are low, too.

Your Allis-Chalmers dealer will be glad to demonstrate what the versatile, economical Model D can do for you.

ROLL-AWAY is an Allis-Chalmers trademark.

40 Brake hp. • 8,800 lb. (bare) • Four speeds forward to 25.6 mph., reverse to 3.3 mph.



Handles light construction on streets, roadways, etc.



Backfills ditches, packs and levels ground, loads excess dirt to trucks.



Scarifies, with plenty of down pressure, accurate hydraulic control.



Mixes thoroughly, with rolling action of ROLL-AWAY moldboard.



Cuts and cleans ditches, slopes banks, grades shoulders.



Loads sand, dirt, snow — any material — to trucks.



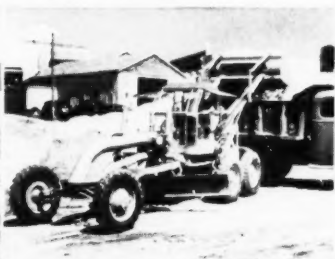
Finish grades between forms on road and street construction.



Levels for home building, parking lots, play areas, etc.



Terraces, builds diversion ditches, does miscellaneous grader work.



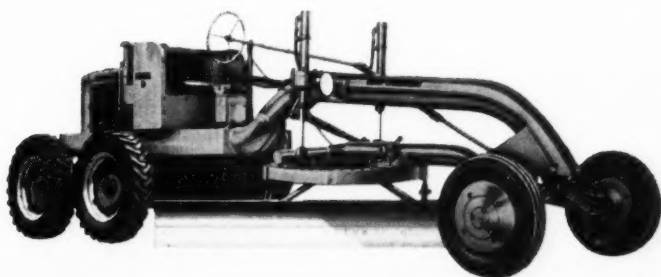
Loads sand, gravel, dirt, any material, with 5 1/2-yd. bucket.



Rough grades, spreads and cleans up on street or road construction.



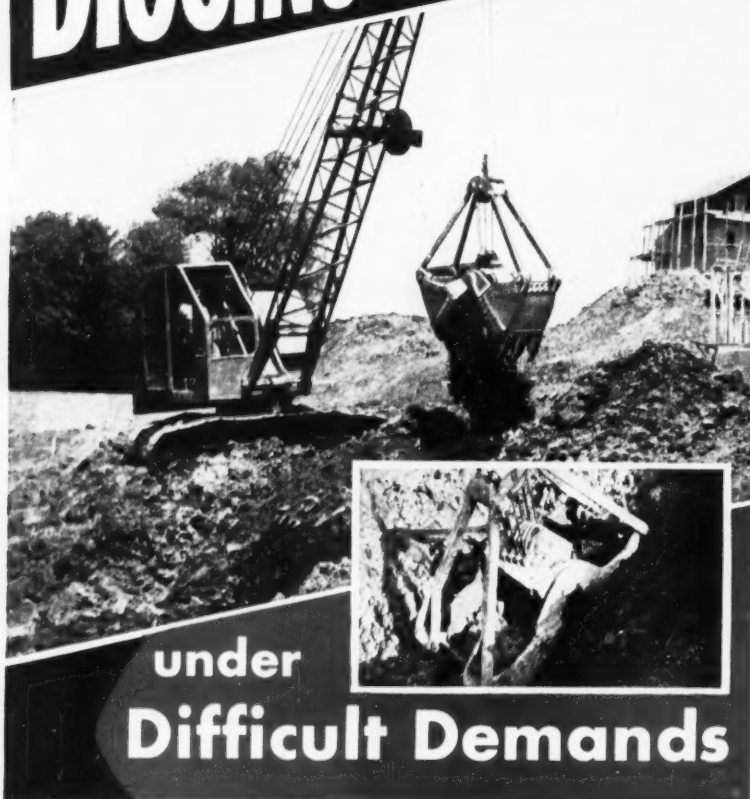
Landscapes, grades lawns, slopes ditches around housing projects



- Designed for your jobs
- Built to take it
- Easy to operate
- Easy to service

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The exceptional "DIG-ABILITY" of Owen Buckets has been acclaimed by crane operators and construction contractors alike since the first Owen was manufactured.

Proof of this is evidenced in the predominance of Owen Buckets seen in operation everywhere on large and small construction projects.

Write for the Owen Catalog and complete information on the line which includes an ideal bucket for every digging, handling or rehandling job.



"A mouthful at every bite"

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JOB TALK . . . Continued from p. 12

open end of a blasting cap to remove it from a box.

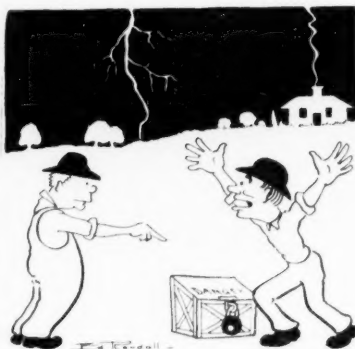
39. DON'T strike, tamper with, or attempt to remove or investigate the contents of a blasting cap or an electric blasting cap.

40. DON'T try to pull the wires out of an electric blasting cap.

41. DON'T connect blasting caps or electric blasting caps to Primacord, except by the methods recommended by the manufacturer.

42. DON'T attempt to fire a circuit of electric blasting caps except by an adequate quantity of delivered current.

43. DON'T use in the same circuit electric blasting caps made by more than one manufacturer.



44. DON'T handle explosives during the approach or progress of an electrical storm. All persons should retire to a place of safety.

45. DON'T make electrical connections without first making sure that the ends of the wires are bright and clean.

46. DON'T allow electrical connections to come in contact with other connections, bare wire, rails, pipes, the ground, or other possible sources of current or paths of leakage.

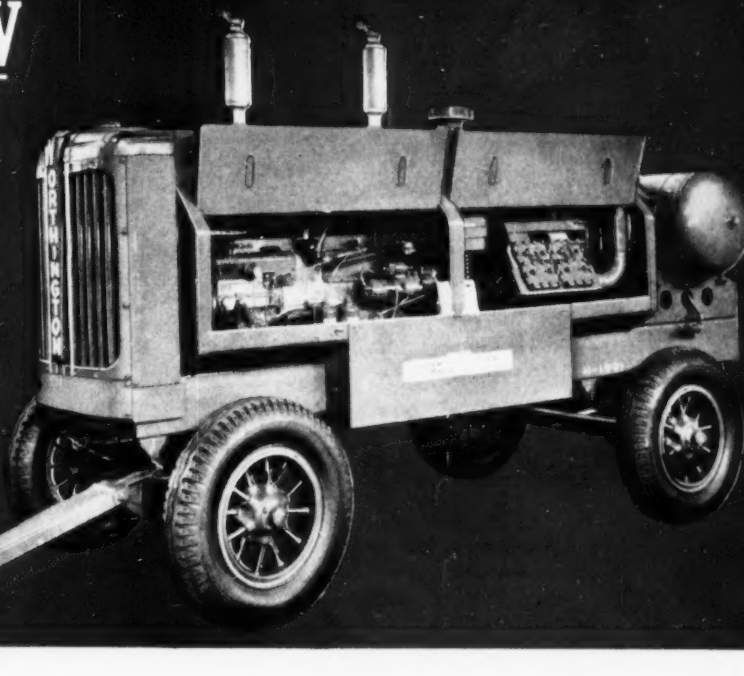
47. DON'T have electric wires or cables of any kind near electric blasting caps or bore holes charged with explosives except at the time of, and for the purpose of, firing the blast.

48. DON'T use electric blasting caps in very wet work unless they have adequate water resistance and suitably insulated leg wires.

49. DON'T use any means other than a blasting galvanometer containing a silver chloride cell for testing electric blasting caps, singly or when connected in a circuit.

50. DON'T use damaged leading
(Continued on page 30)

It's the NEW Blue Brute 600' portable air compressor



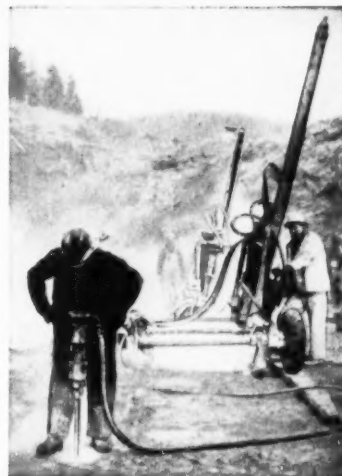
A BIGGER Compressor for your air tools

Here it is . . . biggest and most powerful of all Blue Brute Portable Compressors! This 600' unit *really* costs less to operate, with its *low* fuel consumption and the *minimum* maintenance it calls for.

Just check these Worthington features it incorporates:

Air-operated fuel-saver control that keeps fuel consumption way down (never a pound of unnecessary air pumping, automatic unloading at idling speeds, engine speed in ratio to air requirements) . . . hydraulically controlled clutch for really easy operation . . . identical stack-type, oil-bath air cleaners on engine and compressor for easy servicing . . . two full-length tool boxes with ample capacity . . . two-piece side panels for better temperature control and easy handling by one man . . . unit core radiator and intercooler, offering maximum cooling surface . . . frame protected fuel tank for easy, low level filling . . . three-point engine and compressor mounting . . . formed steel channel frame, semi-elliptical spring mounting and automotive-type steering.

There's even more you'll want to know about this new portable compressor. Write for Bulletin H-850-B74 to Worthington Corporation, Construction Equipment Division, Plainfield, N. J.



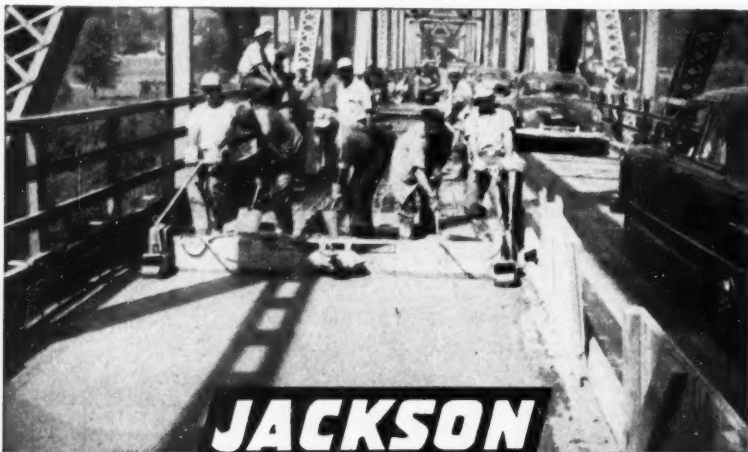
ENOUGH AIR IS LEFT OVER in this hookup with the new Blue Brute 600' and with two 4-inch wagon drills to operate the heavy-duty rock drill in foreground!

H 2 4



If It's A Construction Job, It's A **BLUE BRUTE** Job





HANDIEST and MOST PRODUCTIVE SCREED on the MARKET!

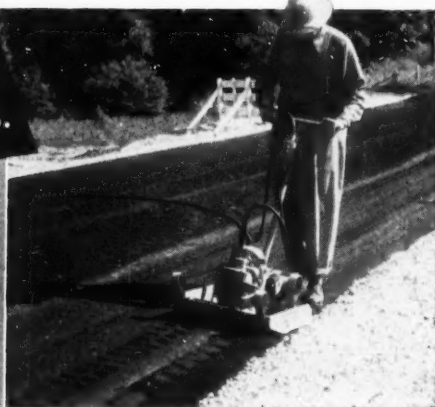
For the tight spots or just straight-away paving you will find the Jackson Electric Vibratory Screed the fastest, most convenient and efficient screed you have ever used. It strikes off to any crown, undercuts at curb or sideform, works up to and around all obstructions. It permits pouring slabs up to 30' without center joint. Requires only two men on widest slab and is the only screed that can be rolled back for second passes on 4 rollers. Powered by Jackson Portable Power Plant. For rent or for sale at your Jackson Distributor. Details on request.

A FASTER, MORE POWERFUL JACKSON COMPACTOR

Now vastly more powerful, this vibratory self-propelled, machine will compact bituminous mixes close to maximum density at the rate of 2400 sq. ft. per hour. Operated from a Jackson Power Plant mounted on auto trailer with quick-pickup of Compactor, it is highly mobile and a tremendous time-and-money saver on jobs such as indicated at the left. Quickly achieves maximum density in granular soils. Available with quickly interchangeable bases of 12" to 24". See your Jackson Distributor or write for details.

**FOR QUICK
CONVENIENT
COMPACTION
of BLACKTOP
in HIGHWAY
WIDENING
& PATCHING
... DRIVES,
WALKS.
GRANULAR SOILS.**

**JACKSON
VIBRATORS
INC.
LUDINGTON, MICH.**



JOB TALK . . . Continued from p. 28

or connecting wire in blasting circuits.

51. DON'T use Duplex leading wire except for single shot firing.

52. DON'T tamper with or change the circuit of a blasting machine in any way for any purpose.

53. DON'T spare force or energy in operating a blasting machine.

54. DON'T store fuse or fuse lighters in a wet or damp place, or near oil, gasoline, kerosene, distillates, or similar solvents.

55. DON'T store fuse near radiators, steam pipes, boilers, or stoves.

56. DON'T handle fuse carelessly in cold weather. If possible, it should be warmed slightly before using to avoid cracking the waterproof coat.

57. DON'T use short fuse. Cut fuse long enough to extend beyond the collar of the hole and to allow time to retire safely from the blast. Never use less than 2 ft.

58. DON'T cut fuse until you are ready to insert it into a blasting cap. Cut off an inch or two to insure a dry end.

59. DON'T cut fuse on a slant. Cut it square across with a clean, sharp blade. Seat the fuse lightly against the cap charge and avoid twisting after it is in place.

60. DON'T crimp blasting caps to fuse with a knife or with the teeth. Use a standard cap crimper and make sure that the cap is securely fastened to the fuse.

61. DON'T use fuse and blasting caps in wet work without having a thoroughly waterproof joint between the fuse and cap.

62. DON'T kink fuse in making up primers or in tamping a charge.

63. DON'T hold the primer cartridge in the hand when lighting fuse.

64. DON'T light fuse in any bore hole until the holes contain sufficient stemming to protect explosives from sparks from the end spit of fuse or a flying match head.

65. DON'T try to light fuse with burning paper, other inflammable refuse, or improvised torches.

66. DON'T light fuse near blasting caps or any explosives, other than those being used in the blast.

P&H

MITI-MITE



ready for any job — anywhere!



GETS AROUND FAST TO LICK HIGH COSTS!

Wherever your jobs may be — 4 blocks or 40 miles away — MITI-MITE gets there in a hurry and does them in a way that means lower costs on every one. It makes new opportunities for you.

That's because MITI-MITE is engineered throughout for truck service *exclusively*. Every operating feature — every detail — down to the final simplicity of mounting on suitable truck — has been properly engineered for the purpose. It's simpler, more practical, more powerful; requires far less servicing.

And, with all this, MITI-MITE has the extra stability that

lets you put more on the hook — apply more power at the tooth point. It means greater safety — greater speed — greater work capacity. It's fully convertible, of course. Ask your P&H dealer for complete details about MITI-MITE. Write for literature.

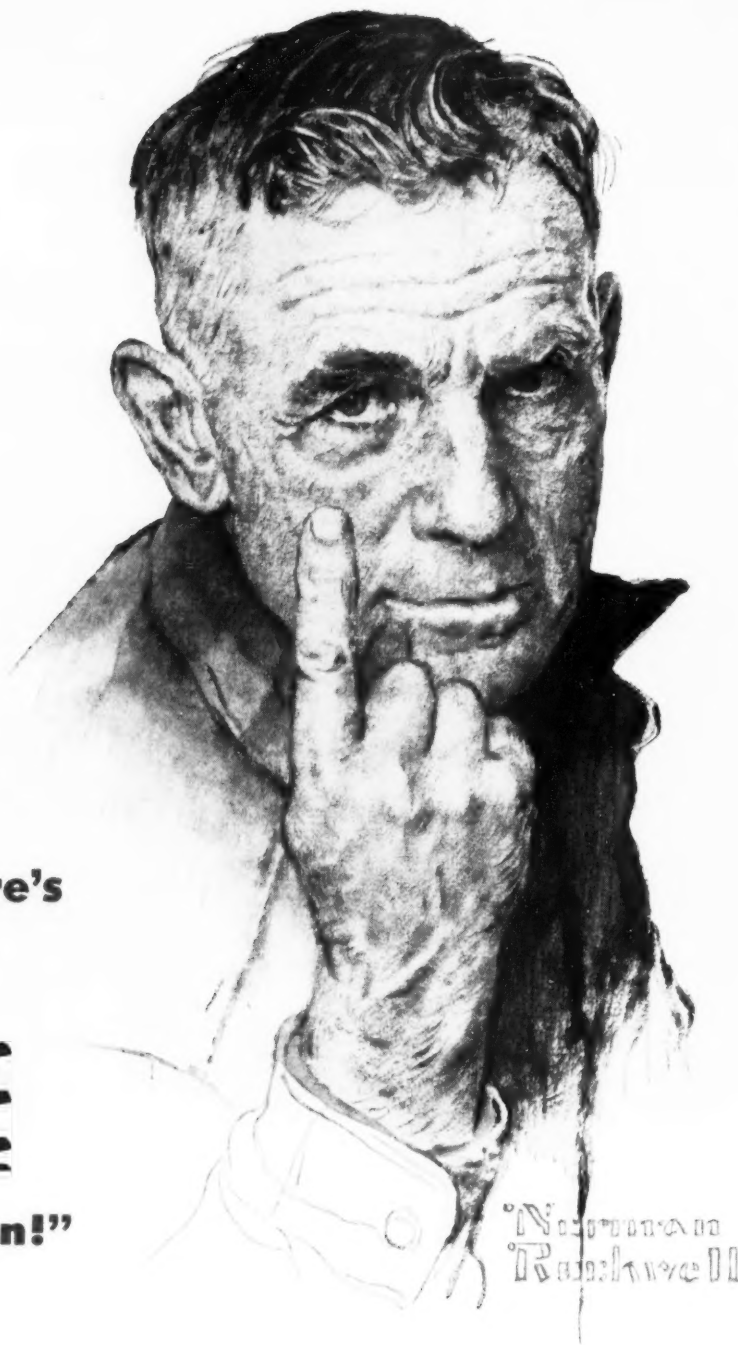
P&H TRUCK CRANE DIVISION
HARNISCHFEGER
CORPORATION

4400 W. National Ave., Milwaukee 46, Wisconsin

*See your **P&H** Dealer!*



**"There's
only
ONE
reason!"**



IT'S JUST THAT SIMPLE. There's only one reason in the world why 2 out of 3 wire rope users in the excavating and construction field prefer Roebling wire rope . . . *it costs a lot less on the job than any other.*

For maximum wire rope efficiency and economy, call your nearest Roebling office for a Field Man. He'll recommend the best ropes for your machines.



ROEBLING **CEI**

A subsidiary of The Colorado Fuel and Iron Corporation

JOHN A. ROEBLING'S SONS CORPORATION, TRENTON 2, N. J. BRANCHES: ATLANTA, 934 AVON AVE. • BOSTON, 51 SLEEPER ST. • CHICAGO, 5526 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDDONIA AVE. • CLEVELAND, 13225 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6316 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 321 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

SWITCH TO GM DIESEL



G. M. Diesel-powered Kuehling shovels loading slag at a steel mill.

FOR MORE WORK AT LOWER COST

Today you can have the extra economy, efficiency and dependability of General Motors Diesel power on *any* job from 16 horsepower up.

This faster-working 2-cycle Diesel is available, for example, as original power in 94 sizes and models of excavators ($\frac{1}{2}$ -yd. to $4\frac{1}{2}$ -yd. capacity) built by 21 different manufacturers.

Two-cycle operation means you get more power from a smaller engine. In many cases, this Diesel fits where others won't. It's smoother, quicker-acting, faster-starting power that "hangs on" to a load and gets more work done on fewer gallons of low-cost fuel.

Clean, simple design makes maintenance easy and economical. Most moving parts are identical for all GM Series 71 engines—2 to 24 cylinders. This feature of interchangeability means parts cost you less and you can protect a whole fleet with a small stock of spares. What's more, you need never worry

about replacements or service, for GM Diesel engines and parts are sold through a world-wide organization of distributors and dealers. There is one near you.

These are solid reasons why you find GM Diesel engines so widely used in everything from air compressors to giant shovels, and available as original or replacement power in more than 750 different models of equipment. Your nearest GM Diesel distributor will gladly show you in dollars and cents why *it will pay you to standardize on General Motors Diesel power.*



DETROIT DIESEL
ENGINE DIVISION

GENERAL MOTORS • DETROIT 28, MICHIGAN

Single Engines... 16 to 275 H. P. Multiple Units... Up to 940 H. P.



T5X guards against breakdowns

To meet tight construction schedules, dump trucks must carry heavier loads for longer hours without breakdowns. That's why so many leading construction companies make sure their engines are protected by heavy-duty T5X motor oil.

Even under the most *severe* operating conditions T5X gives *superior* engine protection. T5X lubrication protects rings, bearings and other moving parts against wear, and greatly extends overhaul periods.

T5X is made from an unusual combination of the finest base stocks and special-purpose compounds. This amazing *purple* oil gives protection against the clogging effects of sludge and keeps engines clean by retarding formation of lacquers and varnish.

Compare T5X with the motor oil you now use. You'll agree with construction men everywhere that T5X lubrication means less wear, lower maintenance costs and greater engine protection under *every* operating condition.

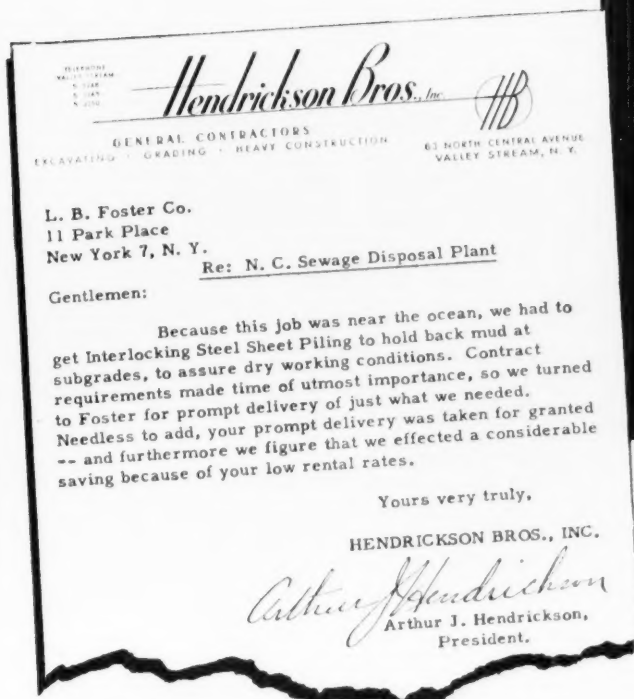
OFFICES: LOS ANGELES: Union Oil Building • NEW YORK: 4904 RCA Building • CHICAGO: 1612 Bankers Building
CINCINNATI: 2111 Carew Tower Building • NEW ORLEANS: 917 National Bank of Commerce Building

UNION OIL 76 COMPANY OF CALIFORNIA

HIGH UP

... on the list of "Economy Short-cuts"
for the \$4 Million Nassau County
Sewer Expansion was ...

FOSTER RENTAL PILING



TELEPHONE
RECORDS - 10-10-10
N. Y. C.
N. Y. C.
N. Y. C.

Hendrickson Bros., Inc.



GENERAL CONTRACTORS
EXCAVATING • GRADING • HEAVY CONSTRUCTION

83 NORTH CENTRAL AVENUE
VALLEY STREAM, N. Y.

L. B. Foster Co.
11 Park Place
New York 7, N. Y.

Re: N. C. Sewage Disposal Plant

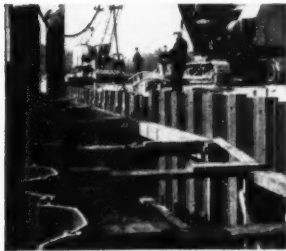
Gentlemen:

Because this job was near the ocean, we had to get Interlocking Steel Sheet Piling to hold back mud at subgrades, to assure dry working conditions. Contract requirements made time of utmost importance, so we turned to Foster for prompt delivery of just what we needed. Needless to add, your prompt delivery was taken for granted -- and furthermore we figure that we effected a considerable saving because of your low rental rates.

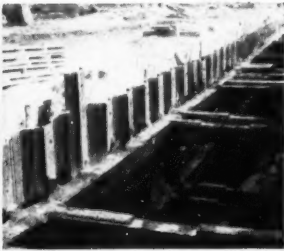
Yours very truly,

HENDRICKSON BROS., INC.

Arthur J. Hendrickson
Arthur J. Hendrickson,
President.



66-inch diameter precast conduit at an average depth of 35 ft.—placed atop a 7-inch concrete slab.



Piling holds back mud for The Sanitary Trunk Sewer conduit which ran 7 miles on Long Island's South Shore.

1,000 feet of Foster Rental Piling serviced 10,000 feet of this job for Hendrickson Bros. They rented 1,000 ft. to be driven in the relatively soft subsurface a total of ten times—piling being in place a week before pulled for re-use in advanced location. The complex piling requirements were best serviced from Foster's large rental stocks with the exact lengths and the exact sections the job required, at economical low rental rates.

Let us quote you on our low-cost piling rentals—prompt service from five Foster warehouses. Send for New Piling Catalog illustrating diagrams and data of all standard-make sections, ask for Piling Catalog CM-3.

RAILS—TRACK EQUIPMENT • PIPE • WIRE ROPE

L.B. FOSTER co.

PITTSBURGH 30, PA. • NEW YORK 7, N.Y. • CHICAGO 4, ILL. • HOUSTON 2, TEX.

You can drive studs **ARROW STRAIGHT**
into steel or concrete with

MODEL 450 REMINGTON STUD DRIVER

*The widest power range of any
powder-actuated tool!*

The Model 450 Remington Stud Driver is the most efficient fastening method in use today. Its exclusive advantages are unequaled by any other powder-actuated tool.

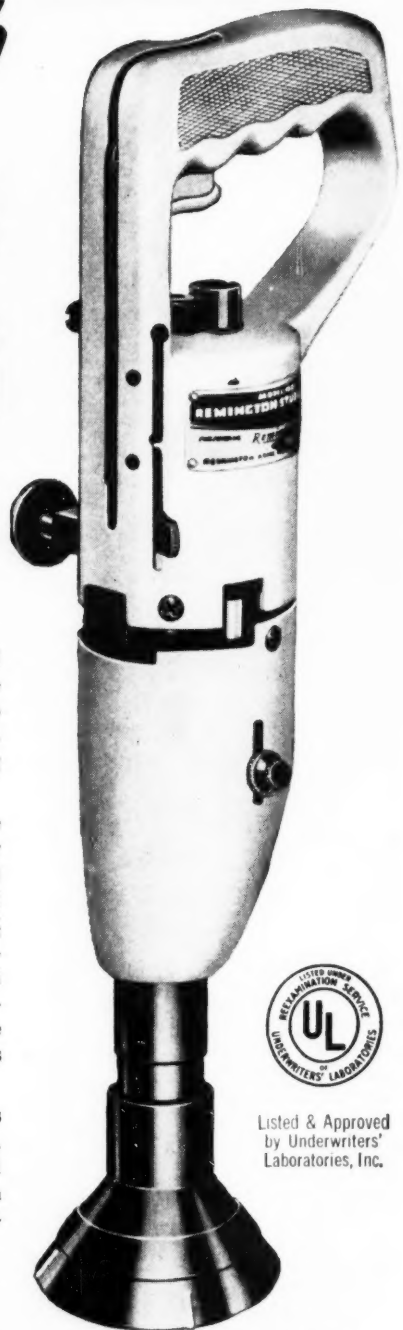
You get consistently straight driving on every type of fastening job with the long heel cap on all Remington cartridges. It acts as a perfect gas seal and provides extra power. These colored heel caps clearly mark the six different 32-caliber power loads that are available. You can select the *right* cartridge for each job quickly and easily.

The Remington Stud Driver needs no separate parts for power control or loading—nothing to lose or break. Just a twist of the wrist opens the Model 450. Insert stud and power cartridge as a unit . . . close and you're ready. Triple safe, this superior tool has a separate lever that must

be depressed and *held* with one hand before and during squeezing of the trigger with the other hand. Two *additional* devices prevent operation except in proper fastening position.

Completely self-powered, the Model 450 sets up to 5 studs per minute in fastening steel or wood structural pieces to concrete or steel surfaces. Its light weight—only 5½ pounds—makes it ideal for use overhead or in confined spaces. To speed operation further, an exclusive ejector snaps the fired case out of the tool instantly—no fumbling, no tools needed.

Test-proved to be the world's finest and speediest fastening system, the Model 450 Remington Stud Driver is made by Remington Arms Company, Inc., America's oldest sporting arms manufacturer.



Listed & Approved
by Underwriters'
Laboratories, Inc.

MAIL THIS COUPON TODAY

Industrial Sales Division, Dept. CME-3
Remington Arms Company, Inc.
939 Barnum Ave., Bridgeport 2, Connecticut

Please send me my free copy of the new booklet showing how I can cut my fastening costs.

Name _____

Position _____

Firm _____

Address _____

City _____

State _____



NEW, FREE BOOKLET shows you a hundred different ways the Model 450 Remington Stud Driver can speed your construction fastening. Packed with illustrations, it tells you where and how this tool can save time, reduce fatigue and cut costs. Send in the coupon below for your copy.

"If It's Remington—It's Right!"

Remington

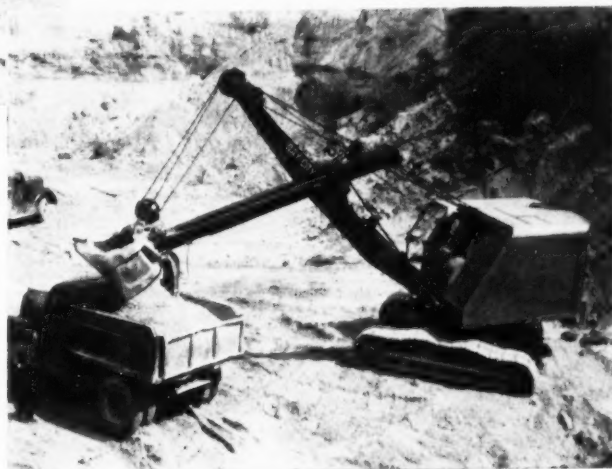


CAN YOU GET THIS REACH WITH YOUR SHOVEL?



◀ 24'-1" CUTTING RADIUS
45° BOOM—½ Yard
Model 30

28'-1" CUTTING RADIUS
45° BOOM—¾ Yard
Model 45
▶



Here we show two shovels—a half-yard above and a ¾ yard at right but both offering wide working ranges which invite comparison with any other shovel of the same capacity. These are two distinctly different models. The ¾ yard shovel is not a built-up machine from the ½ yard design. For instance the Model 45 has a unit-cast base with a 71" diameter roller path whereas the Model 30 has a 56" diameter roller path.

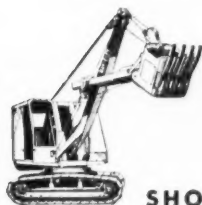
All the way from ground to boom-point the ¾ yard shovel is bigger, heavier and more powerful. However both shovels have tandem drums, one-piece continuous chain crowd, electric dipper trip, power booster clutches and many other heavy-duty design and construction features that mean bigger operating value. Why not get the full story on these convertible shovels today by writing for catalogs.

BAY CITY SHOVELS INC., BAY CITY, MICHIGAN



write for
your
catalog

Get either or both these catalogs, packed with pictures of parts, assemblies and jobs. Ask for Catalog 2530 on the ½ yard and 3745 on the ¾ yard machine—no obligation.



BAY CITY



SHOVELS • CRANES • HOES • DRAGLINES • CLAMSHELLS

SUPERIOR *Cone-Fast* COIL TIES

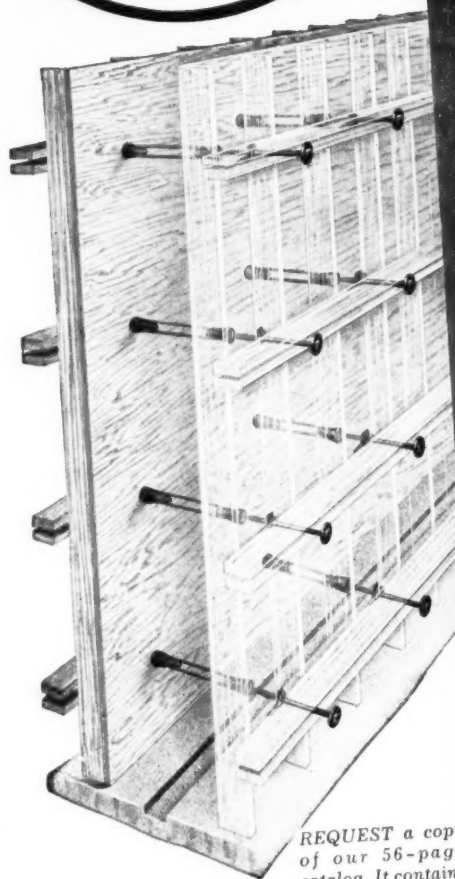


YOU CAN CUT YOUR FORM COSTS!

Because the cost of form work is a prime factor in the total cost of bridge piers and abutments, retaining walls, filtration and sewage disposal plants, and other engineering projects, it is obvious that the forming phase offers the greatest opportunity to save material and reduce labor costs.

The use of Superior Cone-Fast Coil Ties is one direct means of cutting costs and here's why: The exclusive feature of this tie is the extension of the coil beyond the ends of the wire struts (enlarged detail above) which allows a reamed Coil Cone to be fitted snugly in place before the opposing panel is erected. No separate gadgets are required. Cone-Fast ties are practically a "must" when large panels are used on walls where the workman cannot get inside the forms. Cone pointed Coil Bolts are easy to engage because of the large square openings in the cones. Bolt Holders (shown on panel form) keep bolts and washer on panel when stripping and moving for reuse.

Cone-Fast Coil Ties are available for Coil Bolts $\frac{1}{2}$ " to $1\frac{1}{4}$ " in diameter and can be used with all types of forms. All working parts are returnable. For maximum efficiency plan your form work with SUPERIOR Cone-Fast Coil Ties.



REQUEST a copy of our 56-page catalog. It contains a valuable table for spacing studs, wales, and form ties.

SUPERIOR CONCRETE ACCESSORIES, INC.
4110 Wrightwood Avenue, Chicago 39, Illinois

New York Office: 1775 Broadway, New York 19, N. Y.
Pacific Coast Plant: 2100 Williams St., San Leandro, Calif.

New carrier permits GRADALL to go more places—do more jobs!



NEW GRADALL CARRIER

- Rugged, properly balanced design
- Frame extra heavy 8" x 10" H beam, full length
- Tip proof—without outriggers
- Short turning radius—162 in. wheelbase
- Powerful 427 cu. in., 140 h.p. gasoline engine
- 4 or 6 wheel drive
- Remote control of carrier from operator's cab (optional)
- Gross weight 40,000 lbs.—chassis 12,550 lbs.

ON MANY DIFFERENT KINDS of construction and maintenance work—even where working conditions make it impossible to use any other machine—the ruggedness, fast action, and extreme maneuverability of the multi-purpose Gradall have paid off!

And now, the new Gradall carrier makes it possible to go more places, to work better than ever before. Its extra heavy rigid design—reinforced from end to end—with a balanced concentration of weight, gives stability for the toughest jobs—without any outriggers or other supports. Its shorter wheelbase gives the Gradall even greater maneuverability in tight spots.

But see the Gradall in action—find out about the wide variety of jobs you can handle better, faster, and at less cost with this one multi-purpose machine. Contact your nearest Gradall Distributor for a field demonstration.

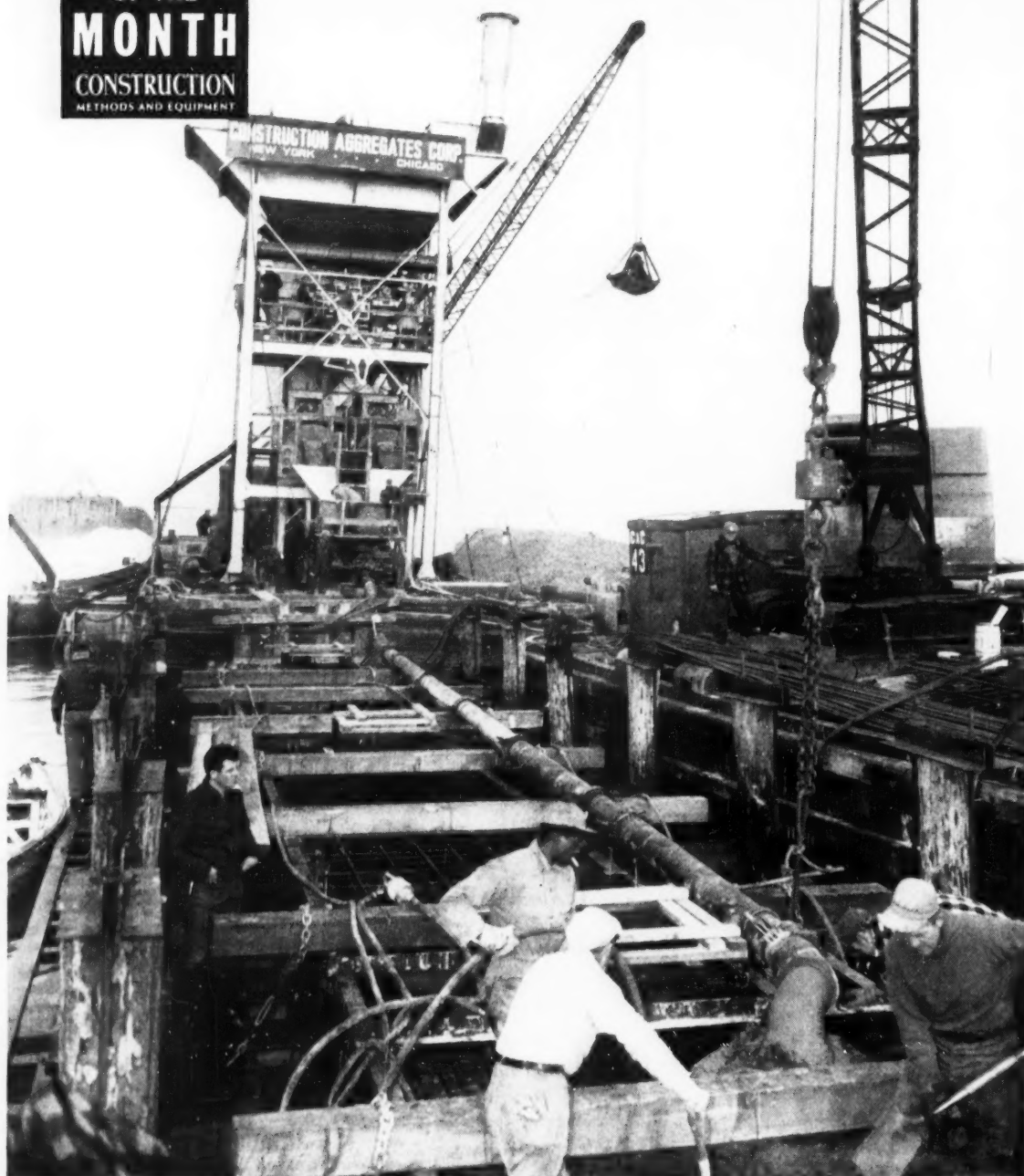
Gradall
DIVISION OF

**WARNER
&
SWASEY**
Cleveland
PRECISION
MACHINERY
SINCE 1880

**Gradall Distributors in over 75 principal cities
in the United States and Canada**

YOU CAN PRODUCE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY MACHINE TOOLS, TEXTILE MACHINERY, CONSTRUCTION MACHINERY

**PICTURE
OF THE
MONTH**
CONSTRUCTION
METHODS AND EQUIPMENT



Concrete Production on the Hudson

VIBRATORS AND SHOVELS are kept busy by discharge from that towering plant on the scow in the background batching, mixing and placing concrete for foundations of the New York Thruway bridge across the Hudson River between Nyack and Tarrytown. Butler bins deliver aggregates and cement to the 1-yd Butler batcher directly below. Batcher dumps alternately into two 285 Rex mixers which feed into a Model 200 Rex Pumpcrete on the deck. A $\frac{3}{4}$ -yd Manitowoc Speedcrane, lashed down behind the batch plant, lifts aggregates from barges to the 150-ton compartmented bin. Behind it (not visible) is a 650-ft Joy compressor. Cement is air-delivered into and out of a 500-bbl cement tank below the "chimney." One man batches and mixes with controls powered by an Onan electric plant. Crane on scow at right handles delivery pipe. Engineer Tom Campbell erected the plant and is in charge of operations for the contractor, Construction Aggregates Corp., New York.

Construction superintendent reports:

"Decided savings" on big Duraplastic* job

On this continuous pour job, Superintendent Phil North found that Duraplastic's outstanding uniformity and plasticity permitted moving the forms "at even speed . . . and quicker." That's why he says it resulted in "decided savings for us."

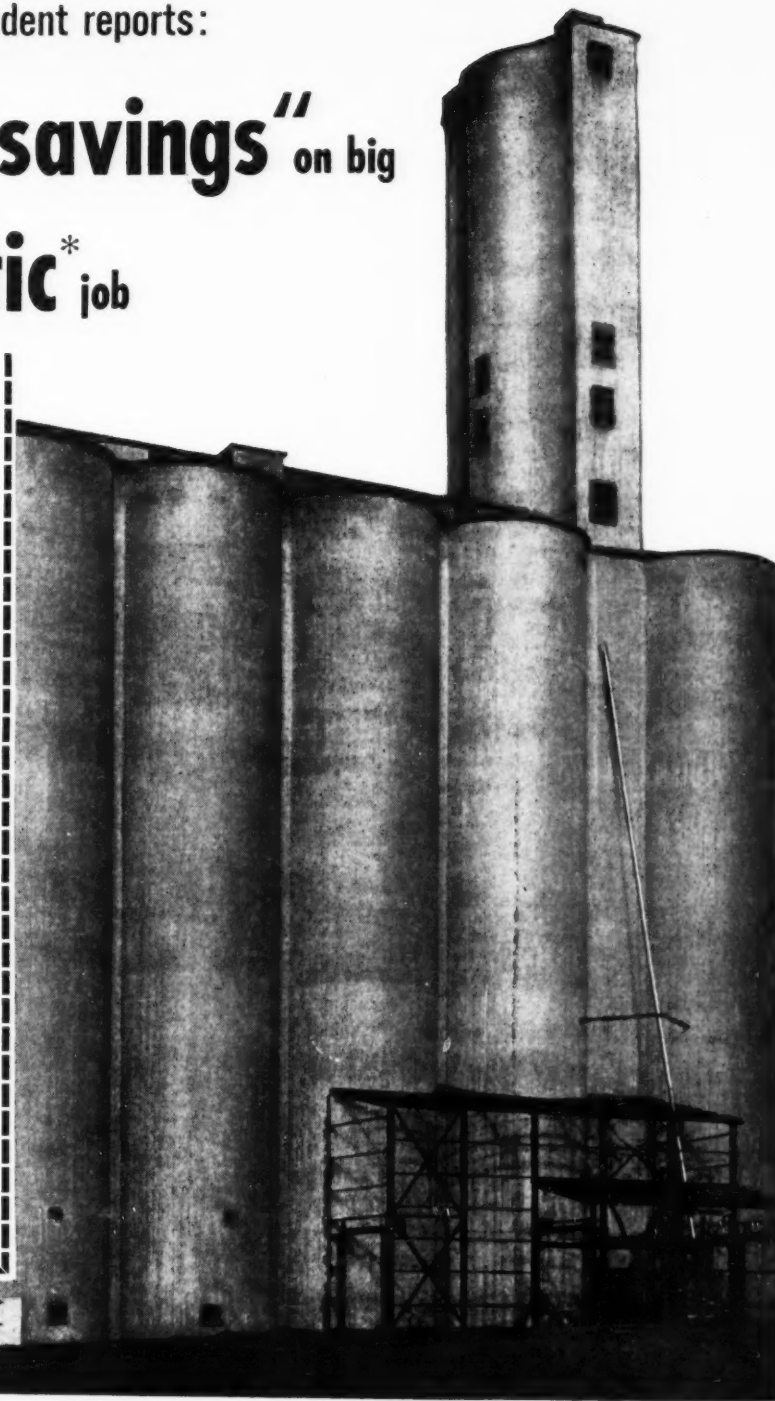
His experience is typical. When you use Duraplastic air-entraining portland cement, less mixing water is required for a given slump. It makes concrete more plastic, more cohesive, more uniform. And the increased plasticity aids proper placement with improved surface appearance.

Moreover, the finished concrete is fortified against effects of freezing-thawing weather, since Duraplastic minimizes water gain and segregation.

COSTS NO MORE

Yet there's no extra price on this extra performance. Duraplastic sells at the same price as regular cement! Complies fully with ASTM and Federal Specifications. Write for free descriptive booklet, Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

To build this half-million-bushel elevator at Lima, Ohio, Felts & Jack Construction Company, Ft. Wayne, Ind., used 28,400 bags of Duraplastic. They find it improves surface appearance, helps cut costs.



*"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company.

OFFICES: Albany, Birmingham, Boston, Chicago, Dayton, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.

ATLAS®

DURAPLASTIC

AIR-ENTRAINING PORTLAND CEMENT



CM-D-147

Makes Better Concrete at No Extra Cost

THE THEATRE GUILD ON THE AIR — Sponsored by U. S. Steel Subsidiaries — Sunday Evenings — NBC Network

UNIVERSAL Spirolocs

HEAVY DUTY TIES FASTEST—SAFEST—LOWEST COST



UNIVERSAL Spirolocs—*heavy duty Form ties...Permanent, reuseable equipment...fast acting Acme threads...washers and stud rods last indefinitely; only inexpensive threaded tie rods expended.*

Spirolocs provide fast erection...easy stripping...available in various time-saving combinations to fit the exact needs of your job.

RENTED...SOLD

**Greater Tie Strength
For less money with Spirolocs**

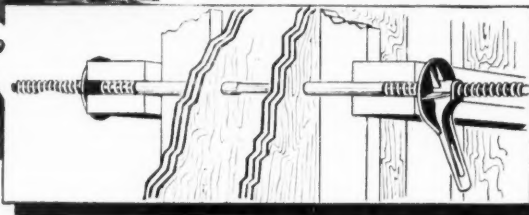
5,000# Ties with $\frac{3}{8}$ -Tie Rods
9,000# Ties with $\frac{1}{2}$ -Tie Rods
14,000# Ties with $\frac{5}{8}$ -Tie Rods
20,000# Ties with $\frac{3}{4}$ -Tie Rods

SPIROLOC CONE NUT ASSEMBLY

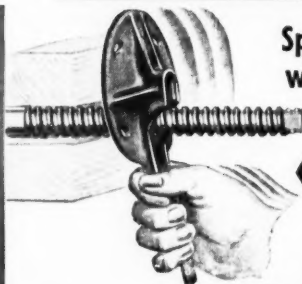


The only fast acting form Tie with an absolutely positive spreader...assures smooth surfaced, watertight walls.

Write for complete details on SPIROLOCS and ask for catalog describing Universal Form Tying Accessories.



**Spirolocs are Furnished
with either Handle or
Nut Type Washers**



THE HANDLE WASHER
SLIP IT ON

**SPIROLOCS
IN ACTION**



THE NUT WASHER
SPIN IT ON

UNIVERSAL FORM CLAMP CO.

GENERAL OFFICES AND FACTORY: 1238 N. KOSTNER • CHICAGO 51, ILLINOIS

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DISTRIBUTORS IN PRINCIPAL CITIES

Service

Wherever

You Build...Coast to Coast



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Construction News in Pictures...



USEFUL HUNGRY HORSE—Truckload of logs rolls across the arcing top of Hungry Horse Dam in Montana, after passing under traveling gantry in the background. New road is in limited commercial use for logging operations clearing a 47-mi Forest Service road up the west side of the Bureau of Reclamation's new reservoir, to open up a new area of marketable timber. Dam has two turbines producing electricity at present.

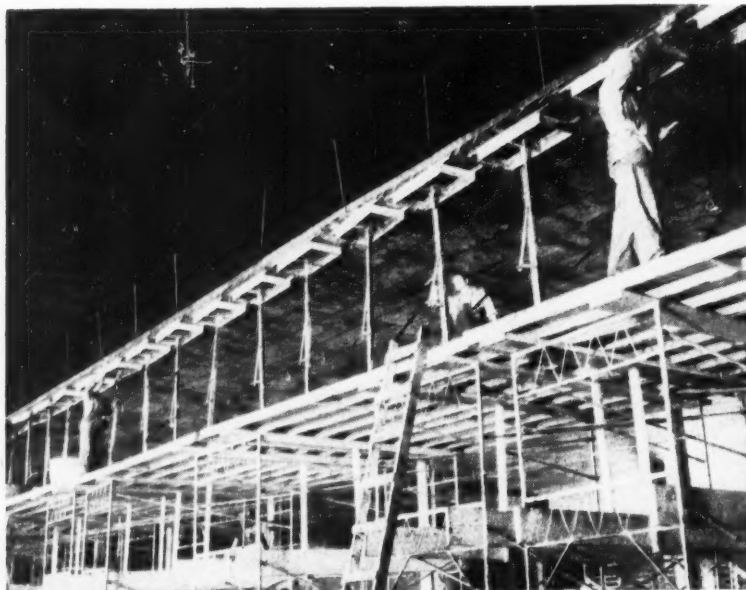


FOR HIGHWAY DRAINAGE—Parsons trencher digs 18 in. wide and 24 in. deep along slab of concrete highway in New York State. A thin layer of gravel is spread along the bottom and 6-in. vitrified clay pipe laid to drain water away more quickly to prevent pavement damage. Gravel is filled in to 1 in. above the pipe and excavated dirt bladed back. Contractor is Brunner Asphalt & Construction, Inc., Buffalo.

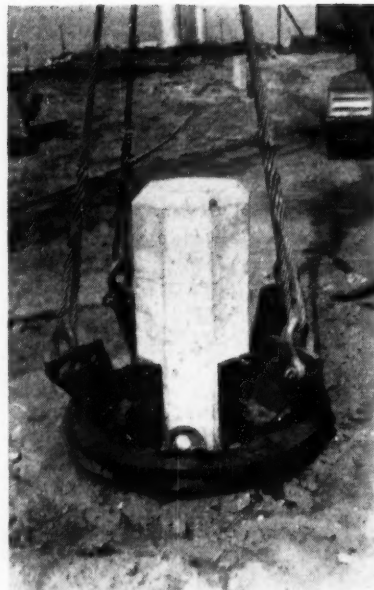


DOUBLE-ENDER—This Caterpillar D8 means business at both ends. Here it is loading lodge pole pine with its Hyster Hystaway for the trip to a nearby sawmill at Cascade, Idaho. Its front

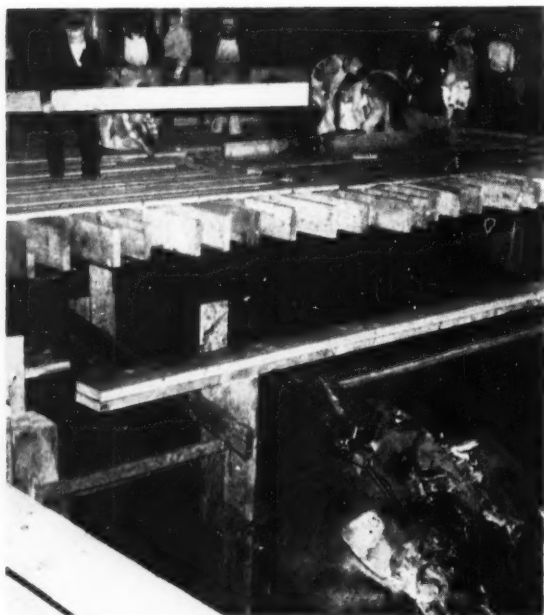
end mounts a Caterpillar dozer to help clear the area for subsequent dredging of monasite, a rare mineral. Machine is owned by J. I. Morgan, Inc., of New Meadows. (Continued on next page)



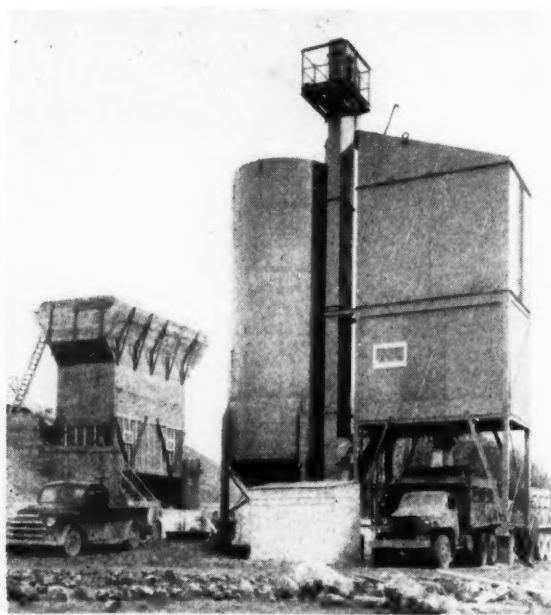
INSULATING THE CEILING—Special jacks press 3-in. asphalt-enclosed Fiberglas insulating board against a similar layer on the ceiling of the new cold storage plant of the U. S. Army Quartermaster Corps in Alameda, Calif. Before placing, the Fiberglas board was sprayed with Laykold insulation adhesive for bonding. Here, 7-in. skewers are being inserted diagonally to help tie both layers together. Subcontractor, Fiberglas Engineering and Supply Co., worked from 4,400 sq ft of rolling scaffolding. General contractor Trewitt-Shields and Fisher built the special jacks.



PILE-PULLER—Concrete piles ranging to 30 ft long are being pulled successfully with this steel ring and its four integral pressure pads. The 38-in. OD ring is made of 4x3-in. stock. Cables from the crane exert pressure through two-point suspension links. —Photo from CEC Bulletin.



TIMBER SAVES THE DAY—Carpenters quickly covered with timber the 300x100-ft hole broken into the floor of the Union Station in Washington, D. C., by a runaway train five days before President Eisenhower's inaugural. The locomotive is on the floor below. Within 72 hr after the accident, virtually all scars had been removed. The National Lumber Manufacturers Assn. rightly points with pride to a good job done quickly thanks to the versatility and easy fabrication of lumber.



TWO FIRSTS—Heltzel Steel Form and Iron Co. claims these to be the first fully automatic, electronically controlled batching plants. They, incidentally, are pouring out the first dry batches for the Ohio Turnpike—for twin bridges near Cleveland being built by the Horvitz Co. Precision-designed to meet the rigid specifications of the Ohio Turnpike Commission, the combination of cement batcher (foreground) and aggregates batcher (left rear) can turn out 250 yd per hr.

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6-TON CRANE

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**...the new
Model T-35
BANTAM®**



*Price includes complete 6-ton crane unit with std. 25' boom, 12" block, 2 part line and extra cwt. FOB Waverly, Iowa. Truck and mounting charge extra. (Price subject to change)

Owners of over 3500 Schield Bantam shovel-cranes will tell you that the famous M-49 Bantam was "the finest machine in its class . . . unequaled in all-around performance and low maintenance cost." BUT wait 'till you see the husky new Bantam T-35! You get 20% more lifting capacity, plus a host of advanced operating improvements . . . still at the lowest price in the industry! How can Schield Bantam do it, you ask? Simply because we specialize in building *only one size* shovel-crane . . . and because we build *more of them* than anyone else, we are able to give you a constantly better machine, at a lower price. For convincing proof, ask your Schield Bantam Distributor for a T-35 demonstration, or write today for free descriptive literature, containing full information.



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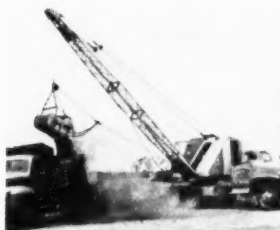
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- Power boom hoist standard at no extra cost — for extra precision.
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SB-CR-22



T-35 DRAGLINE excavates 90 cu. yds. per hr. Simplifies loading trucks, feeding crushers . . . ideal tool for digging basements, drainage ditches, stock ponds, etc.



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T-35 CLAMSHELL handles gravel and bulk materials at 80 cu. yds. per hr. . . makes extra money digging trenches, footings . . . handles debris, scrap, etc.



T-35 SHOVEL gives you 90 cu. yds. per hr. production with automatic cable crowd. Saves time working roadside pits, handling road repairs, general clean-up.



QUOTE:

"The Schramm 315 c.f.m. Diesel Engine Driven Compressor illustrated is being used by the Racquette River Construction Corporation, Potsdam, N. Y., on the Niagara Mohawk Power Corporation job at Carry Falls.

For the past year, this compressor has carried the brunt of our drilling for rock excavation, pressure grout holes, and rock rip rap quarrying. We ordinarily use four individual hammers drilling two feet to six feet holes and occasionally have out

as much as eight hundred feet of $\frac{3}{4}$ " hose, in the aggregate. For the grout holes and rip rap, we use the machine to operate two 50 pound wagon-mounted hammers drilling twenty feet holes.

When not employed as mentioned above, we use the compressor for such other jobs as cleaning concrete surfaces with air, pumping water (with an air mop) and pressure grouting."

Cordially yours,
RACQUETTE RIVER CONSTRUCTION CORP.

Frederick Rexford,
Superintendent

... and

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THAT CARRIED THE BRUNT
OF THE DRILLING JOB!**

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SCHRAMM, INC.

The Compressor People
WEST CHESTER • PENNSYLVANIA

SCHRAMM AIR COMPRESSORS

**A SIZE AND MODEL
FOR EVERY AIR NEED**

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60



105



210



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BUSY CONTRACTORS WILL LIKE THIS FAST TURNOVER IN ROAD-AIRPORT FORMS..



Heltzel Combines Two Standard Forms To Simplify Handling • Reduce Inventory

If your business calls for multiple form sizes you'll want to know about the HELTZEL DUAL-DUTY FORM. Here are two individual form heights combined into a single form section. Simply turn it on its side and you have the second height. Latest form designs lend themselves to this arrangement naturally—providing lower initial purchasing costs and greatly reducing inventory problems.

The forming of the second rail on each form section greatly strengthens the section—assuring longer life. What's more, every DUAL-DUTY carries all the normal Heltzel features so popular with contractors today: corner-to-corner bracing—formed stake pockets; single, sure-bind wedging that eliminates counter thrust of a second wedge—and re-rolled rail stakes, heat-hardened and sharpened to penetrate toughest rock conditions, assuring firm grip and perfect form alignment.

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Three integral form devices, exclusive with Heltzel, can be readily adapted to Dual Duty Form for jobs calling for doweling. Field tested, these methods assure accurate alignment, fast handling and easy stripping. Others engineered upon request.

Naturally It's A



"CATERPILLAR"

By-passing Sherman Hill grade

How a relocation job on the U.P. will speed west-bound rail traffic

For years the Union Pacific's long grade over 8,014-foot Sherman Hill in southeastern Wyoming has been known as an engine-killer. It was to boost trains up that slope west of Cheyenne that U. P. built the famous "Big Boy" locomotives. Now the mighty helper engines are headed for the same fate as the buffalo. A new 42-mile main line, with easier grades, is being built to the south.

Railroad relocation accounts for a considerable share of U. S. construction right now. It is a natural consequence of the swing to Diesel locomotives—longer trains—longer passing tracks. The roads are doing some of this work with their own off-track equipment. In other cases, where more earthmoving must be done, construction firms are being called in. The Union Pacific project is probably the biggest of the lot. It will cost \$16,000,000 and involves the moving of 2,500,000 yards of rock, 4,000,000 yards of earth.

When the two-year job is finished, the U. P. expects to cut 15 minutes from its west-bound running time and use main line locomotives all the way through.

The contractors, Morrison-Knudsen Company, Inc., have assembled a big array of "Caterpillar" equipment on this job. "Cat" Diesel Engines power the shovels and compressors. Big yellow D8 Tractors, Bulldozers and Scrapers handle the shorter hauls. And speedy "Caterpillar" DW20 wheel-type Tractors, with No. 20 Scrapers, make eight round trips per hour over a one-mile haul distance.

These machines are constructing 111 major fills, up to 164 feet in height; installing hundreds of drainage culverts;



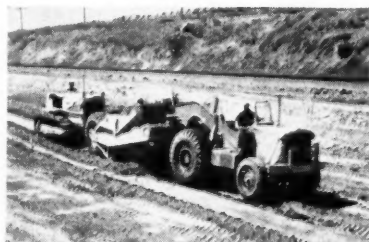
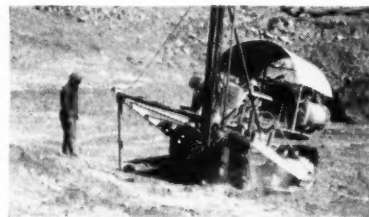
A "Cat" Diesel D397 Engine provides the logging power for this Manitowoc 5-yard shovel, making a cut for the new U. P. main line near Sherman Hill, Wyoming.

Worthington compressors, mounted on sturdy "Caterpillar" D8 Tractors, drill blast holes in rock for Morrison-Knudsen Co., Inc.

and blasting through solid red granite to make cuts, one of them 140 feet deep and requiring the removal of 350,000 cubic yards of rock.

Morrison-Knudsen's reputation for putting big contracts through on time has a solid foundation in the tough, dependable "Caterpillar" machines that make up such a large proportion of the firm's equipment.

One of Morrison-Knudsen's big, husky yellow "Caterpillar" DW20s and No. 20 Scrapers picks up a 20-yard load for a fast run to the fill.



CATERPILLAR TRACTOR CO., PEORIA, ILLINOIS

Harold W. Richardson, Editor

Coming Up: More and Better Equipment

THERE'S BIG DOINGS in the construction equipment world today. Just trying to keep track of the mergers, consolidations and buying-up of various companies makes one dizzy. And those manufacturers who aren't consolidating or buying out other firms are hard at work on new products and improvements of present models. It all adds up to mighty good news to the buyer and user of equipment.

Let's take a quick look at what has happened recently, and what's in the cards as they're being dealt today. First of all, it is apparent that the major tractor manufacturers who don't now have rubber-tired equipment, are bound and determined to get on the rubber bandwagon.

Caterpillar did it not so long ago by a successful effort with the DW20 and DW21 rigs, stepping up the old DW10 line. Allis-Chalmers did it by buying LaPlant-Choate, giving A-C a nice line of rubber-tired wagons, tractors and a new array of scrapers, and, of course, a hold on the long-established LP-C bulldozers. What this means to Baker and Gar Wood, former staunch affiliates of Allis-Chalmers, is still a puzzle to the customer—but we'll bet those firms are somehow going to carry on and stay in business with a bang, too.

International Harvester needs rubber to keep up with the parade, so it stepped out and bought the Hough Payloader front-end loaders as a starter. Rumors of further purchases by IHC in the rubber line have died down with the realization that Harvester probably is going to come out with its own line of big wheel tractors. Remember, too, Pullman Standard bought Isaacson not long ago, and continued

Isaacson's former relationship with Harvester. Bucyrus-Erie also is very much in this International picture with a long-time supply of scrapers for Harvester tractors. Just what the outcome of this situation will be is anybody's guess. But again, we'll predict that both Pullman and Bucyrus-Erie scrapers will be moving dirt for a long time to come.

Gar Wood stepped out and acquired a line of trenching and backhoe equipment, and then came out with a shovel of the company's own design. Don't sell these fellows short in the future equipment picture. Mack and White are furnishing the big truck rigs for earthmoving, and Dart now claims the biggest of all end-dump trucks, 60 tons capacity. Pettibone-Mulliken is constantly expanding its line of construction equipment by purchasing firm after firm.

You can discount rumors about Adams, LeTourneau and Euclid being in the market for consolidation. These are three stalwart firms we'll predict will remain independent and aloof.

Biggest conjecture at the moment is: What will General Motors do? It is no secret now that GM has hired engineers from other equipment manufacturers, and intends to step out into production of construction equipment. Just how soon and how far is problematical at the moment. But GM is certain to become a big factor in the equipment field in the not-so-distant future.

Why all these mergers and consolidations? Just a determination on the part of firms involved to round out their lines, present a bigger and better package of equipment to their customers, and to remain in top competitive position.

But these mergers are only a part of the picture of what's happening in the construction equipment field. The rest of the story lies in new models and improvements announced or planned by practically every manufacturer. You users of construction equipment are changing over from beggars to buyers—and the manufacturers know it. They realize if they can't now offer you something better than they ever have before, you won't be interested—because the other fellow will hand you something newer and better than you ever had before.

So the manufacturers are going to have to produce, and sell something new and better, or you won't be interested. They're in a highly competitive market for the first time in years. And you buyers are calling the shots.

Out of all this comes a better day for the contractor and user of equipment. You're going to have faster, more efficient equipment at your disposal. You can choose and select as you never have before. And you're going to find the manufacturers ever more solicitous of your desires and needs. And that goes for every type of equipment from small power tools to the largest earthmovers.

You buyers of equipment will never have had it so good, and you'll be equipping your jobs better than ever. That means more efficient, faster and better construction—which, after all, is the basis of an ever-expanding America.

Rich



PANORAMA OF CONSTRUCTION AREA for Folsom Dam. (1) 3,300-ft conveyor belt for aggregates crosses the American River on a suspension bridge spanning 500 ft between piers; (2) diver-

sion tunnel outlet; (3) excavation, preliminary formwork and concrete for 162,000-kw power plant. Three-hundred-foot long concrete wall protects against high water in winter, becomes part of perma-

Concrete Placed off Trestle at Folsom

HIGH WATER notwithstanding, construction goes forward steadily on Folsom Dam on the American River near Sacramento, Calif. This Corps of Engineers project is a big one; contract is for \$29,400,000. Merritt-Chapman & Scott Corp., New York, and the Savin Construction Corp., Hartford, Conn., are joint contractors.

Folsom Dam is part of an over-all plan for development of the American River Basin and will provide flood control protection, as well as irrigation and power. Its 162,000-kw power plant is being built by the Guy F. Atkinson Co. of San Francisco, under a contract with the Bureau of Reclamation.

The dam's main concrete section will be 1,400 ft long. Wing embankments of rock and earth extend its length to more than 2 mi. Height will be approximately 340 ft and three penstock tunnels, each 15½ ft in dia., will feed water to the power plant.

Construction of the dam requires

Photos by the Sacramento Bee and Merritt-Chapman & Scott

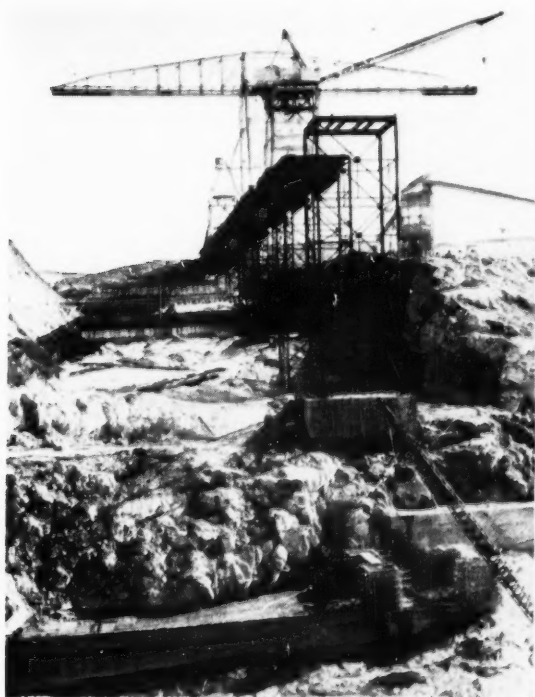


STEEL TRETTLE starting from left abutment will cross river section to serve concreting operations. Rail car brings loaded concrete buckets to cranes. Earthfill cofferdam in right background now has been washed away by high water.

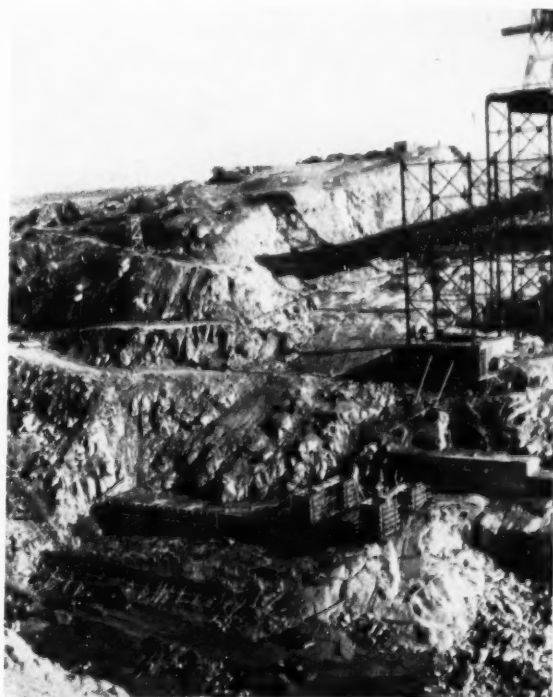


nent structure; (4) earthfill right abutment of dam; (5) excavated area for the 1,400-ft concrete section of the dam; (6) completed section of trestle from which concrete pouring operations are han-

dled. Trestle will be extended across river and concrete and incidental materials placed by one hammerhead and two revolving cranes; (7) diversion tunnel inlet.



LOOKING UP THE AREA cleaned off for the left abutment. Concreting has started in the background, trestle construction continues. About 50% of trestle will be encased in concrete of dam.



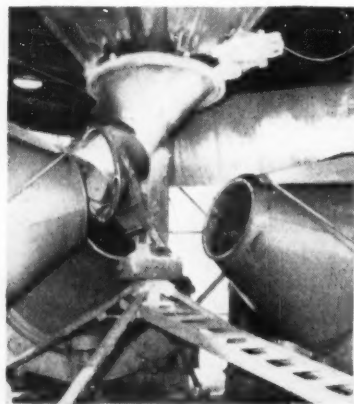
EXCAVATION TO BEDROCK goes on, and more foundations for trestle are under construction. Since picture was taken, heavy rains have sent river down foreground area, washing out several structures.



AGGREGATES CONVEYOR BEGINS at far right where trucks dump into bunkers, suspension bridge carries it across river. Rectangles in foreground are settling basins for waste water from batch plant. Powerplant tail race is under construction at right.



CONCRETE PLANT is a \$1,000,000 installation by Johnson Co. and York Corp. Refrigeration and ice equipment cools batches to 50 deg on hottest days. Capacity is 225 yd per hr.



SWIVELING SPOUT on rapid-cycling batch plant charges three 4-yd Koehring mixers alternately with sand, cement, gravel and ice.



NOT PLAYED BY EAR, but controlled electrically to extreme accuracy, is the Johnson batch plant, operated by a single operator.

the excavation of more than 9,000,000 yd of earth and rock. It is estimated that 1,108,000 yd of concrete will be poured and some 8,800,000 yd of fill will go into the wing dikes.

Flow of the river has been diverted through a 1,500-ft diversion tunnel by an earth cofferdam directly upstream of the damsite. Since the diversion tunnel can handle only 12,000 sec ft of water, it was expected fully that high water during the winter would breach the cofferdam and, accordingly, precautionary measures were rushed so that construction could continue during the winter even if the cofferdam broke.

The cofferdam broke earlier than expected, under pressure from heavy rains. Although most equipment had been moved out of the way, failure of the barrier caused damage estimated around \$350,000, due to sections of steel trestle, a large amount of lumber and some pumps being carried away by the flood.

At the power-plant site downstream, damage was not extensive because a protective rock-fill cofferdam, reinforced by sheet piling, and a 300-ft concrete wall, a permanent part of the power plant, had been constructed hastily to protect the partly completed plant under just such circumstances.

It's a big job, and things are



CONVEYOR TERMINATES at the concrete plant after winding up the hill. It is covered to exclude sun, rain and wind, has hopper-

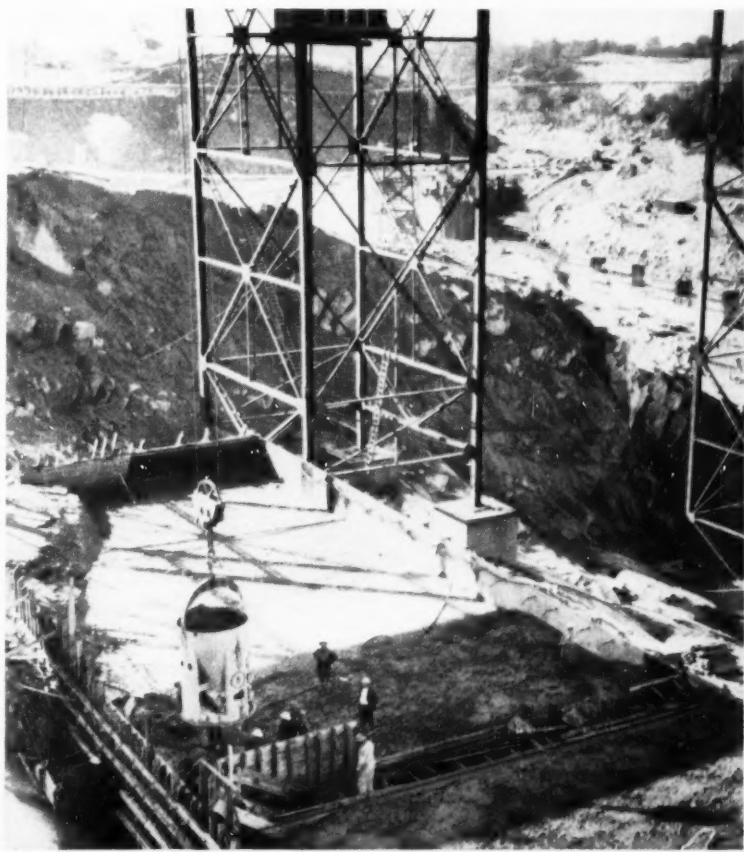
like boxes at several points which can be used as transfer stations. Aggregates are re-screened at end of conveyor.

done in a big way at Folsom. Aggregates are obtained 3 mi downstream where materials are loaded by shovels and draglines, hauled by truck one-half mile upstream to the crushing and screening plant which has a capacity of 700 tons per hr and turns out sand and four sizes of stone.

Trucks haul aggregates from the stockpiles and dump into a receiving "boot" on the right bank of the river just below the powerhouse tail race construction area. From here, aggregates travel via a 3,300-ft U-shaped belt conveyor across to the left bank, up a long slope and around to the top of a low hill where they feed into the batch plant—located about 200 yd from the left-bank abutment of the dam. Material leaving the conveyor is re-screened before entering the batch-plant bins.

Concrete production and pouring are handled in one of the most modern plants conceivable. The C. S. Johnson Co. and the York Corp. have come up with a joint \$1,000,000 design that will produce 225 cu yd per hr, with attendant refrigeration equipment that permits capacity production of batches cooled to 50 deg on the hottest day.

York Corp. equipped the insulated installation with the latest in ice manufacturing and refrigeration equipment. Ice goes into the mix when required and cement,



CONCRETE POURING for the dam is done with 4-yd Blaw-Knox buckets placed by one of the cranes on the trestle over head. Buckets are loaded at the mixing plant; a small rail car brings them to the trestle. Concrete section will be 1,400 ft long, 340 ft high.



POWERHOUSE CONSTRUCTION by the Guy F. Atkinson Co. advances under a contract with the Bureau of Reclamation. It is located

at the foot of the river's right bank, will produce 162,000 kw. Floodlights are placed all over the site.



WAGON DRILLS BORE down to bedrock in the stream bed below the dam for excavation of material that has to be removed in ad-

vance of concreting the spillway. Air for the drills comes via a long pipeline from compressors on the left bank.

delivered at 150 deg, is cooled as it goes through screws to mixers. Cold air is circulated through the aggregates, except the sand.

Johnson automatic batching control and recording, run by a single operator, makes for fast cycling time and keeps three 4-yd Koehring tilting mixers discharging regularly into a hopper that loads the 4-yd Blaw-Knox buckets used to pour the lifts in the dam.

Unfavorable terrain made the contractors decide against the use of a cableway to place concrete in the dam. Instead, a steel trestle is being extended from the left bank across the river bed parallel to the dam. A small diesel-powered locomotive and rail car haul buckets with concrete from batch plant out to the trestle.

Three Cranes on Trestle

On the trestle is a large hammerhead crane, gantry-mounted and traveling back and forth on rails, which lifts loaded buckets from the rail car and lowers them to areas being poured in the dam. The hammerhead is flanked on each end of the trestle by a 40-ton Washington Iron Works revolving crane, also operating from a gantry traveling on the rails used by the hammerhead. These two end cranes set steel, handle materials as necessary, and assist the larger crane in placing concrete.

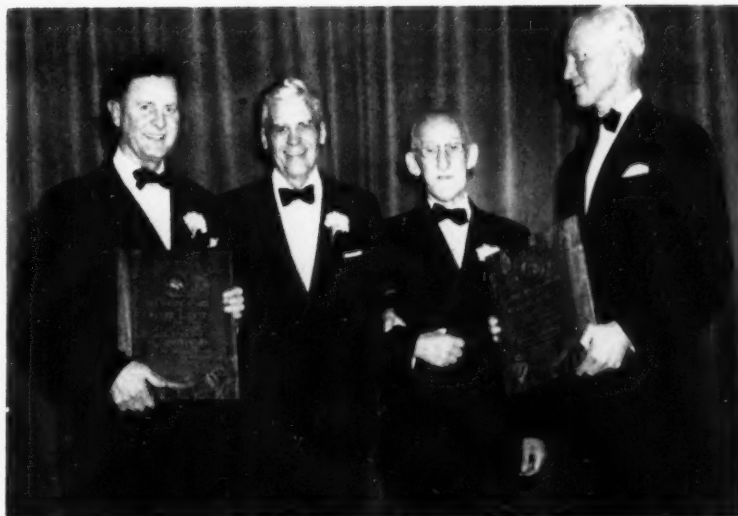
Although high water is delaying some operations across the normal stream bed, concreting is being carried on along the left abutment higher up on the bank.

This Happens Too Often

OUR BEST SAFETY EFFORTS seem hopelessly inadequate when similar accidents keep occurring chiefly because another man has decided on the spur of the moment to take a chance.

It happened again recently down South when a 20-yr-old oiler got himself caught in the 8-in. space between the cab frame and the crawler track of the dragline he was oiling while it was in motion. There were no eyewitnesses, but it was apparent that he was lubricating the left travel sprocket without telling the operator. When the cab swung, he was trapped and received fatal injuries.

The dragline was being operated by the oiler's father.



MOLES AWARD WINNERS for 1953 receive their bronze plaques for outstanding achievement in construction. Shown are George F. Ferris, Moles second vice-president, who presented non-member award to Peter Kiewit; Mr. Kiewit; Edward P. Palmer, member award winner; and J. Rich Steers, Moles past president, who made award to Mr. Palmer.

Moles Honor Kiewit and Palmer

MORE THAN 1,000 of the country's foremost construction men paid homage to Peter Kiewit and Edward P. Palmer at a banquet last month when they were presented with the Moles Awards. Given annually to one member and one non-member "for outstanding achievement in construction," the awards are considered the highest recognition for service to the industry. Kiewit and Palmer are the thirteenth pair to be thus honored by the Moles—a New York association of leaders in the heavy construction business.

Peter Kiewit, non-member award winner, is president of Peter Kiewit Sons' Co. and its various affiliates, with headquarters in Omaha. He was honored as "Constructor extraordinary; in recognition of his rare vision, enterprise and superb skill; notably in the fields of public service and worldwide heavy construction."

Behind the award winner stand hundreds of millions of dollars worth of solid construction accomplishment. Kiewit has built highways in 15 states; such widely scattered dams as Bull Shoals (Arkansas), Hungry Horse (Montana), Garrison (North Dakota), Fort Gibson (Oklahoma), Philpott (Virginia) and Boysen (Wyoming); dozens of airports (including huge Project Blue Jay built in secrecy

in northern Greenland); and many Veterans Hospitals and other buildings. One of his current jobs is the \$1.2-billion Atomic Energy Commission plant in Ohio.

Edward P. Palmer, member award winner, is head of the New York City construction firm of Senior & Palmer, Inc. He was honored for "his outstanding engineering accomplishments and his supreme ability, notably in the fields of pneumatic foundations, tunnels and industrial relations."

Palmer, too, has many well-known projects behind him. He was connected with construction of New York's 7th and 8th Ave. subways and foundations for numerous bridges, including the George Washington span over the Hudson.

One of the most construction-industry-minded men, Palmer has constantly sought to better the conditions under which the contracting business has to operate. He was a member of the Contractors Code Authority in the days of NRA; president of the Associated General Contractors of America; for 13 yr a member, and for 6 yr chairman, of AGC's Labor Relations Committee; construction advisor to the Munitions Board; and member of the National Joint Board for the Settlement of Jurisdictional Disputes in the Construction Industry.

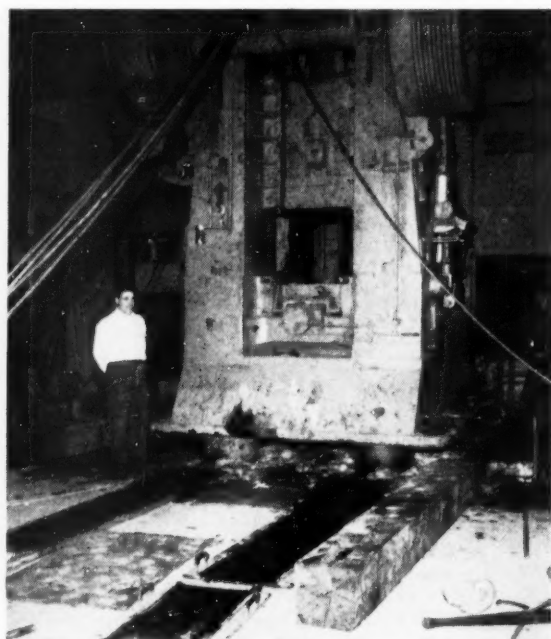
Heavy Presses Are Set by Novel Methods



PRESS IS UNLOADED from flat car on which it was delivered, by lines from drums of two truck cranes that pull 248,000-lb unit on to cribbing. It will now be ramped to ground.



PRESS IS RIGHTED after being slid on its side to door of shop. Monstrous 1,600-ton capacity machine is more than 26½ ft high.



PRESS IS SKIDDED on steel-plate tracks to foundation site inside shop building. Base of the press is nearly 8x10 ft in plan.

IT MIGHT HAVE BEEN a huge construction cocktail they were mixing—Central Steel Erecting Co. had ordered up 24,000 lb of ice and what amounted to 53 cu ft of gin. But the ice was for lowering a 1,600-ton capacity forging press into its foundation pit. And the gin was in the form of an 18-in. gin pole 30 ft long for handling a smaller, 750-ton press. Nevertheless, these ingredients let Central's Superintendent Paul E. Thomasch smoothly swallow a thorny machinery rigging job, with no resultant hangover.

The Utica (N.Y.) erection firm installed the two powerful presses in the local plant of Utica Drop Forge & Tool Corp. The bigger baby weighed 248,000 lb, and stood more than 26½ ft high on its 7-ft 3-in. by 9-ft 8-in. base. It had to be unloaded from the special flat car on which it was delivered, then turned upright from its horizontal shipping position during a 1,575-ft move to its foundations inside the shop.

For the first part of the move—the unloading—the press was just pulled sideways on to cribbing

and ramped down to the ground. Seven-part lines direct from the hoist drums of two truck cranes furnished the pulling power.

For the trip to the shop, two well-greased 24-in. WF beams 50 ft long were laid flat on the ground to serve as tracks. On the beams rested heavy 15-in. channels which, in turn, carried three 12x12-in. oak timbers 10 ft long fastened across the width of the press. The channels kept the beam flanges from cutting into the wood as the press was skidded along by a seven-part line from a crane drum.



PRESS LOWERS ITSELF by melting 24,000 lb of ice with which its foundation pit was filled. After 200 hr of sitting on ice, press will have sunk to place 4 ft below floor.



PRESS IS GUIDED during descent by cables and turnbuckles from floor to top.

Two sets of the track beams were provided, so the press could be moved up to the door of the building in 50-ft steps.

Then the unwieldy unit had to be stood upright. Two cranes hooked on to the top of the press with two 1½-in. cable slings and tilted it up, while cribbing was set beneath it for safety. Both of the cranes were reeved with ten parts of ¾-in. cable, independent of each other. One of these machines was a new 35-ton P&H mobile rig with 40 ft of boom. The other, also on rubber, was a 25-ton HC-90 Link-Belt Speeder.

(This latter crane, however, had been altered by Central Steel Erecting to handle heavier lifts. The company fabricated a new 15-ft bottom section of boom and added to it a 5-ft top section made of ¾-in. plate. A 20-in. four-sheave block was fastened to the boom tip. With this new 20-ft boom, and with an additional 5,800-lb removable counterweight at the rear, the machine has picked as much as 47 tons off the ground.)

Ice Fills Foundation Pit

Now upright, the press could be slid through a doorway into the shop building and up to its foundation pit. Track for this part of the move was a series of 1-in. steel plates 24 in. wide and 10 ft long. A winch truck anchored to deadmen and reeved with seven parts of cable did the pulling.

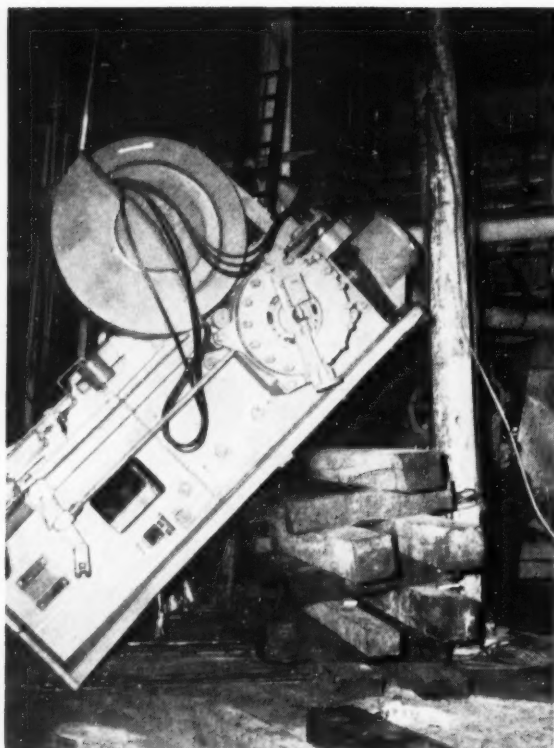
Meanwhile, the press's 8x10x7-ft deep foundation pit had been filled with 24,000 lb of block ice. The weighty machine was merely skidded on to this ice and allowed to melt its way into final position



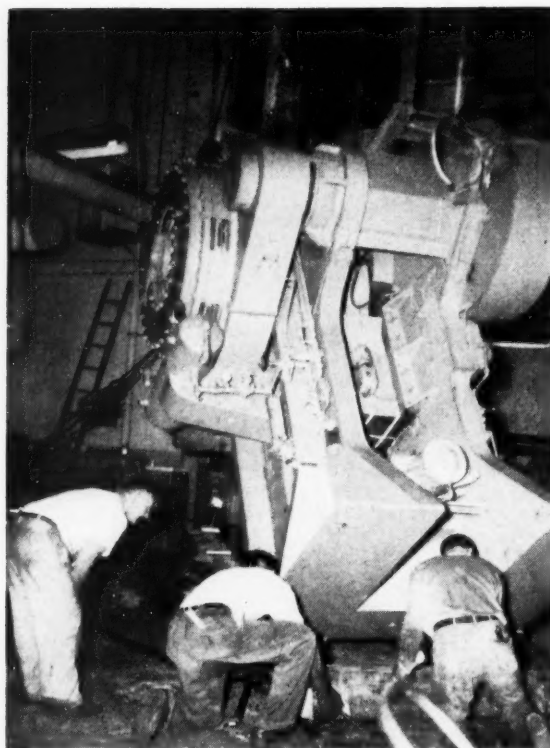
ALTERED CRANE teams up with a regular one to unload from flat car a smaller 750-ton capacity press weighing 114,000 lb. Originally a 25-ton crane, it has picked 47 tons.



TRUCK TRAILER will deliver press to door of shop, where two cranes will unload it to be rolled inside. This press is 5x18 ft.



18-IN. BY 30-FT GIN POLE tilts press upright, as base slides along steel straps set on floor. Load line leads from crane drum.



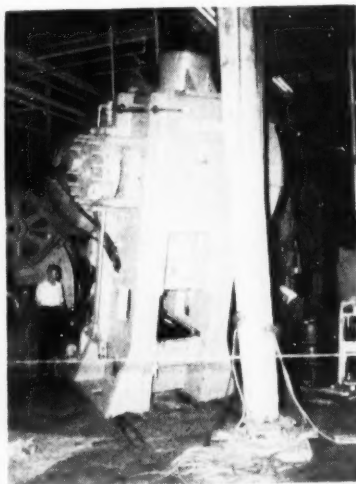
TIMBER CRIBBING for safety is placed beneath base as press is tipped, and also is carried up on other side of machine (left).

on special supports 4 ft below floor level.

It took just 200 hr and 7 min for the 248,000-lb press to sink into place. The only troublesome thing about the ice lowering scheme was that the machine's center of gravity was about 15 in. off the center of the base. This gave it a tendency to lean as the ice melted. So, to guide it, four $\frac{5}{8}$ -in. cables were run from the top of the press to anchors previously embedded in the shop's concrete floor just for that purpose.

Turnbuckles took up the slack in the cables as the press settled in the ice. The tackle was checked at frequent intervals, and by tightening the cables in the direction in which the press was to move, the machine was guided into exact position.

The smaller 750-ton press weighed 114,000 lb and was 18 $\frac{1}{4}$ ft high. Setting this machine was complicated not so much by weight as by clearance: It had to be taken into the building lying down to pass under a low balcony with no headroom. And, to right the press, it was impossible to rig from the building's superstructure or to set up an A-frame. A gin pole was



UNWIELDY PRESS nears vertical under steady pull of line from gin pole. When upright, it will be moved into exact final position.

indicated. But first the press had to be unloaded and moved 1,000 ft to its location inside the shop.

Two 25-ton Link-Belt cranes (one of which was the altered, stub-boom machine) picked up the 114,000-lb press bodily from its de-

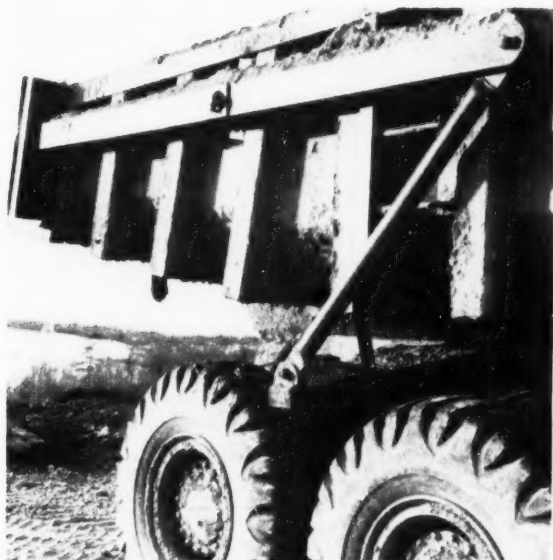
livery flat car and loaded it on to a truck trailer. At the plant door, the cranes again made the lift and laid the press down on rollers that carried it to the base of the gin pole.

The gin pole Central used had started out long ago as a sailing vessel's mast—a 90-ft double-tapered stick of Georgia pine with a 24-in. middle diameter. Cutting and trimming by the riggers from year to year had reduced this to the 18-in. by 30-ft gin pole that was set up to erect the press.

The pole was rigged with four sets of live rope guys running from a top-mast spider and reeved through two- and three-sheave blocks. The load line, which led from a crane's hoist drum, was reeved through two three-sheave blocks. Hitched to the top of the press with a 1 $\frac{1}{2}$ -in. cable sling, the gin pole slowly tipped the machine upright while two chain hoists kept the bottom of the press from sliding too far as it approached the vertical.

Data and photographs for this article were furnished by Paul E. Thomasch, superintendent for Central Steel Erecting Co., Inc., of Utica, N. Y.

Slop-Tight Endgate Added to Mack Trucks on Job



IN EXCAVATING the canal section of the intake to Sir Adam Beck Generating Station No. 2 at Niagara Falls, Ont., the Hydro-Electric Commission of Ontario ran into trouble in hauling soupy muck up steep ramps in big Mack end-dump trucks. The sloppy material simply ran out the rear end of the dump bodies. T. S. Johnson and A. J. Leighton, a couple of hustling young engineers in Ontario Hydro's construction equipment department, devised the clever slop-proof endgate for these trucks, as shown in the accompanying pictures.

The pictures tell the whole story with little explanation needed. Tapering channel brackets were welded to the truck frame on each side between tandem rear wheels. These brackets were designed to snap in case of overload before the frames would be broken. A flush endgate, fitting tight against the truck body, was mounted on the end of a pair of side-arms pivoted on the body sides. A pipe strut connected the opposite end of each side-arm with the corresponding bracket.

As the dump body was raised to discharge position, the endgate automatically rose clear of the body, clearing the bed by 8 ft at maximum raised position. When the dump body was returned to haul position, the endgate fell back into place. Simple, but effective! And they worked perfectly.

Ontario Hydro Photos





PRECAST CONCRETE SHELL, 19 ft in dia and weighing 60 tons, is lowered carefully to bottom of bay by 75-ton barge-mounted crane (it's an American Hoist and Derrick Co. steam-powered model). This big cylinder was cast on the barge, becomes base for one leg of pier to carry power line over ship channel.



SURVEYOR SIGHTS top of pipe tower set inside concrete base (showing more clearly in photo at left) for correct alignment of heavy concrete shell on bay bottom. He works from temporary platform built on 24-in. pipe piles. Note triangular spreader block below crane hook for 1 3/4-in. lift cables.



UP-ENDED UNDER WATER to minimize strain on supporting cables, pier leg then is eased to its base. Placing is done during slack tide with diver guiding bottom. Triangular block clears and equalizes cables.

Heavy Precast Members Make Sturdy Tower Foundations

By L. L. WISE, Associate Editor

HEAVY PRECAST CONCRETE units are being put to exceptional use in constructing under-water piers for a new electric transmission line across the south arm of San Francisco Bay. After conferring with contractors in the field, the owner—Pacific Gas and Electric Co.—decided that on-shore pre-casting and on-site assembly were preferable, and cheaper than the more conventional methods of caisson or cofferdam construction.

The successful low bidder, Ben C. Gerwick, Inc., by effective use of a bay shore casting yard and floating equipment, proved PG&E's contention. The units slipped into place as easily as a small boy puts together an Erector set—except, that the size and weight of the big

concrete pieces called for exceptional planning ability and handling skill.

The contract includes all the foundation work for several miles of transmission line. There are many different types of footings in the route. But only 19 of the foundations are in water and require use of the precast concrete assemblies. Of these, 17 are shallow-water piers and 2 are deep-water piers.

These latter are set in 60 ft of water on each side of the main ship channel and support higher towers than any of the others. Accordingly they are bigger and involve heavier pieces.

The deep water piers are based on wood pile clusters, 23 piles for



DIVER WALKS ON AIR as he takes plunge to check position of concrete shell. The big cylinders are placed on a sand mat around a cluster of 23 wood piles. Diver can knock off high spots on sand with air jet to assure even footing for the concrete piers. He also unbolts pipe tower for re-use.



OCTAGONAL PIER LEGS go down next. These precast "pipes" are 60 ft long, 7 ft in dia and weigh 60 tons, are lifted with a three-point pickup and handled much like a concrete pile—although much heavier. Note long tremie pipe lying on barge used to fill base cylinders and pier legs.

each tower leg. Piles were driven with an under-water hammer into firm material after a 15- to 20-ft depth of soft mud had been dredged out. The excavations were backfilled with sand, leaving a 5-ft length of piles extending above the sand.

Heavy precast concrete shells were placed over the piles. These shells are 19 ft in dia, 16 ft high, 8 in. thick and weigh 60 tons each. They include an interior reinforcing cage with a steel hollow saucer suspended two-thirds of the way up.

Next, pier legs in the form of 60-ft long, 60-ton, 7-ft octagonal-shaped hollow shafts are placed on end, resting on the saucers. More tremie concrete is poured in the base cylinders and in the pier legs (after a reinforcing cage has been placed).

Final step is placing of 45-ton cross-beams above the water to brace the tower legs.

Project manager for the contractor is Don Weaver.

Design of the tower units is by the division of civil engineering, Pacific Gas and Electric Co., and construction supervised by the company's own construction department.



BARGE LOAD OF CROSS-BEAMS, each weighing 45 tons, is brought out to the site. Beams and pier legs were cast in contractor's yard located on tidal creek some 50 mi away.



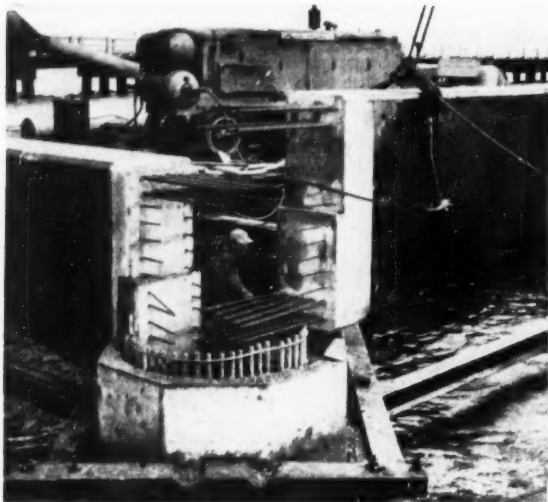
SLINGS ARE ATTACHED around end of the haunched beam to keep the main lifting cables from sliding inward during placing. Work goes on in all weather as long as water is not too rough. This was a rainy day.



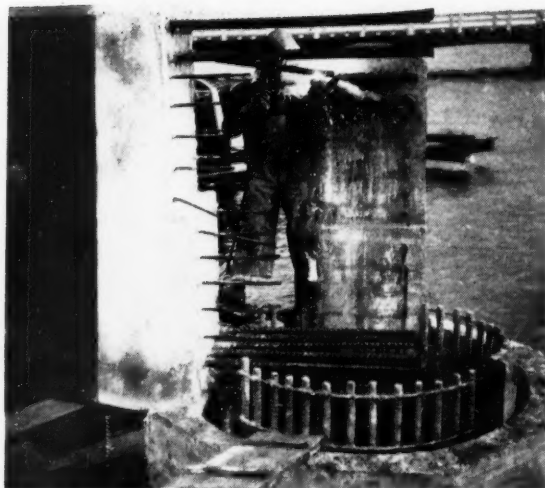
END OF BEAM is set into place on top of octagonal tower leg now partially filled with concrete. Note reinforcing steel around vertical leg and workman inside.

(More Photos on next page)

TOWER FOUNDATIONS . . . Continued



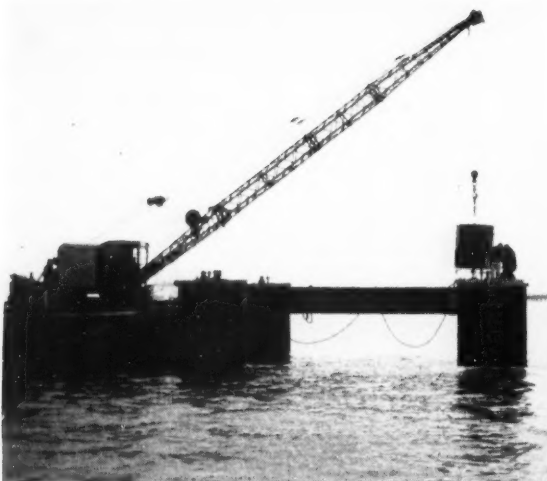
REINFORCING STEEL begins to mesh as second cross-beam is set on octagonal pier leg to create one of the corners. Beams are set at 1-ft elevation difference to prevent interference of reinforcing steel. Work platform in rear also supports Caterpillar-powered Chicago Pneumatic compressor.



WELDER TACKS BEAMS together by welding on a diagonal bar from one to the other as soon as they are set, to prevent accidental moving or tipping. Additional dowels will be added and a concrete plug poured which binds all the units together and sets anchor bolts for the transmission tower steel frame.



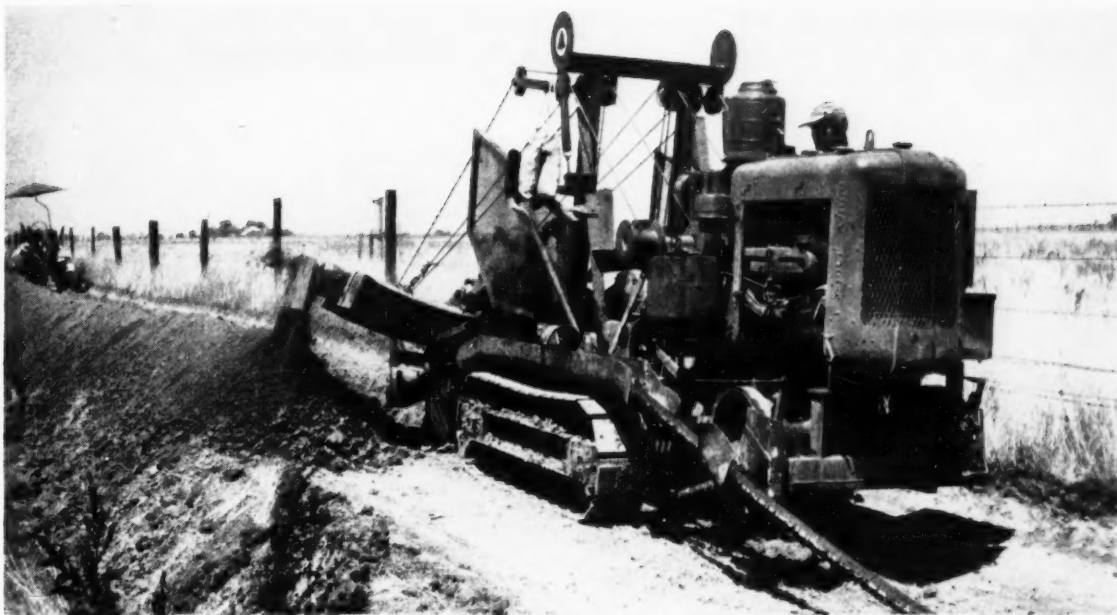
BARGE-MOUNTED CONCRETE PLANT services the offshore electric transmission tower construction with both tremie and structural concrete. Here, the steam-powered derrick loads rock from an aggregate barge alongside into the plant hopper. Batch plant is a regular Noble unit cut down in height to lower the center of gravity of the waterborne assembly. Mixing is done with a 1 1/3-yd Multifoot paver. The crane up forward is a Lorain Moto-Crane unit with its truck wheels removed. It handles concrete buckets and tremie pipes.



CONCRETE IS POURED from a Garbro 3/4-yd bucket to set anchor bolts on one of the shallow water piers. There are 17 of the smaller piers, all in shallow water and supporting smaller towers than the two flanking the main ship channel.



ONE OF SMALLER PIERS being prepared for pouring final concrete for anchor bolt setting. Crane is supporting small booster pump to dewater interior of tower leg. A two-lane bridge approach causeway is in the background.



1 CABLE TROUGHS at each end of trencher and over crawler let rig pick up telephone cable, splices and all, and lay it in ditch. Previously, cable was paid off reel into trench, or else laid on ground and then set in. In either case, wide holes had to be dug, where splicers worked in dust or mud. New attachment that lets

splicing be done above ground was devised by Pacific Telephone & Telegraph Co.'s construction superintendents Harry C. Hemenway and Cliff O. Ekstrom. They also developed two other gadgets pictured below. All three were for Sacramento-Stockton (Calif.) job where 38-mi toll cable was buried in 10½x40-in. ditch.

These Three Gadgets Ease Cable-Laying



2 COMPACTION WHEEL on nose of motor grader that back-fills trench lets rig handle all tamping too, thus eliminating hand work formerly required. Hydraulically controlled device is powerful enough to lift machine's front wheels high off ground.



3 REEL BRAKE with adjustable tension lets trailer pay out cable in straight lengths on top of the ground, where it is spliced before burying. This N carrier cable (the first such buried on the Pacific Coast) is 84-quad, 19-gage, 336-conductor.



IT'S 50 FT UP to top of that steel, which makes this Ontario Hydro tunnel at Niagara Falls the biggest long tunnel in the world—and there are two of them, side by side, each 5.4 mi long. Steel timbering is required only above springline.

New Tunneling Achievements Reached In Driving Big Ontario Hydro Tubes

By HAROLD W. RICHARDSON, Editor

● On October 10, 1950, a new treaty between the United States and Canada came into force, providing for diversion of additional water above Niagara Falls for hydro-electric power generation, both countries to share equally the added amount of water made available. By January 1, 1951, Canada, through the Hydro-Electric Power Commission of Ontario, started construction on facilities to utilize its share of the new diversion—a project known as Sir Adam Beck Generating Station No. 2, designed to contain ultimately twelve 100,000-hp units.

They planned the development in two stages. First stage was to include seven 100,000-hp units in a new plant just upstream from the existing Sir Adam Beck No. 1 station (formerly Queenston), 4.8 mi of 45-ft finished dia tunnel and $2\frac{1}{4}$ mi of open cut canal 200-ft wide and some 80 ft deep. Four units were to be ready in 1954, the next three in 1955.

But we Americans still are bickering as to who will build the corresponding new

project on the New York side of the river—private utilities, the New York State Power Authority, or the federal government. (A bill now before Congress would authorize private utilities to proceed.)

Incidentally, the treaty provides that until such time as there are facilities in the territory of one party to use its full share of the diversions of waters for power purposes, the other party may use that share.

Our good Canadian friends, faced with an unprecedented demand for power decided in the spring of 1952 to proceed with the second stage of the development, involving a parallel tunnel and five more generating units.

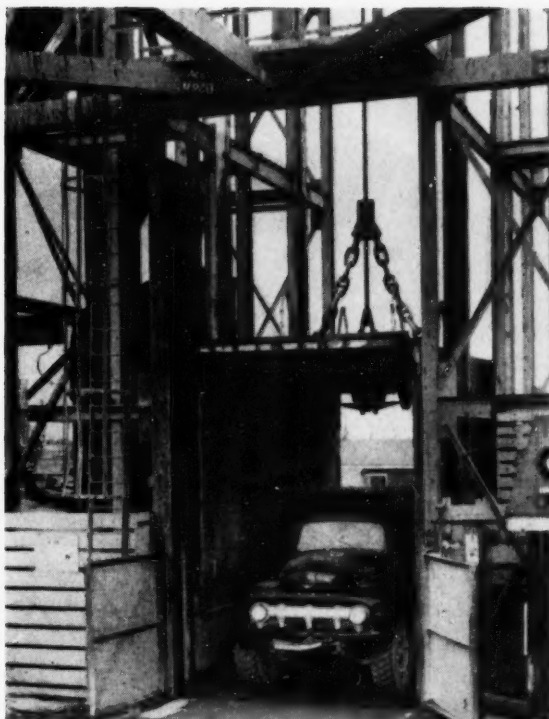
Thus, the Canadian project is now proceeding toward ultimate installation of all 12 units, and the two parallel tunnels, which will divert 40,000 cfs. Total cost will be about \$299,000,000. A previous article on the project, devoted largely to canal excavation, appeared in CM&E Feb 52, p. 48.—EDITOR

THEY AREN'T the biggest tunnels, nor the longest, but they are the biggest long tunnels and the longest big tunnels in the world—those twin 51-ft excavated dia bores, each 5.4 mi long, being driven under Niagara Falls, Ont., for The Hydro-Electric Commission of Ontario's new Sir Adam Beck No. 2 generating project.

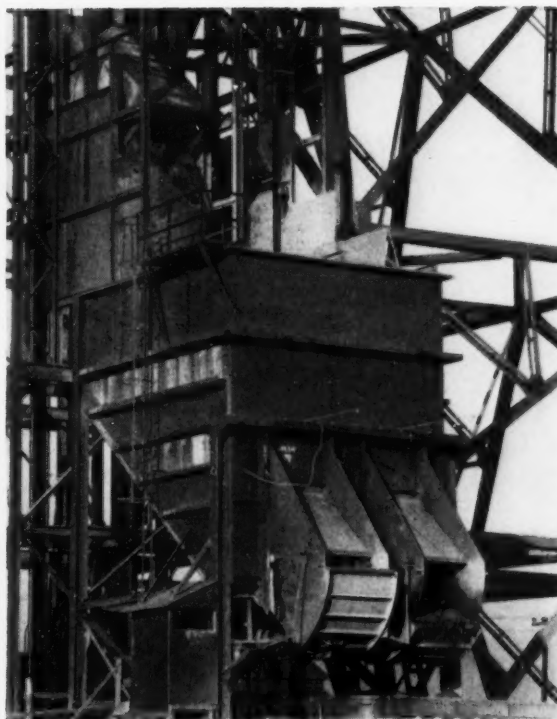
Driving of these huge headings is bringing new advances, new techniques and new achievements to the art of tunneling—here is modern tunneling at its best.

Traditionally, Ontario Hydro does all of its construction with its own forces, and such is the case on the Niagara Falls job today, except for the tunnels. Having only limited tunneling experience, the Commission decided to award major underground operations to con-

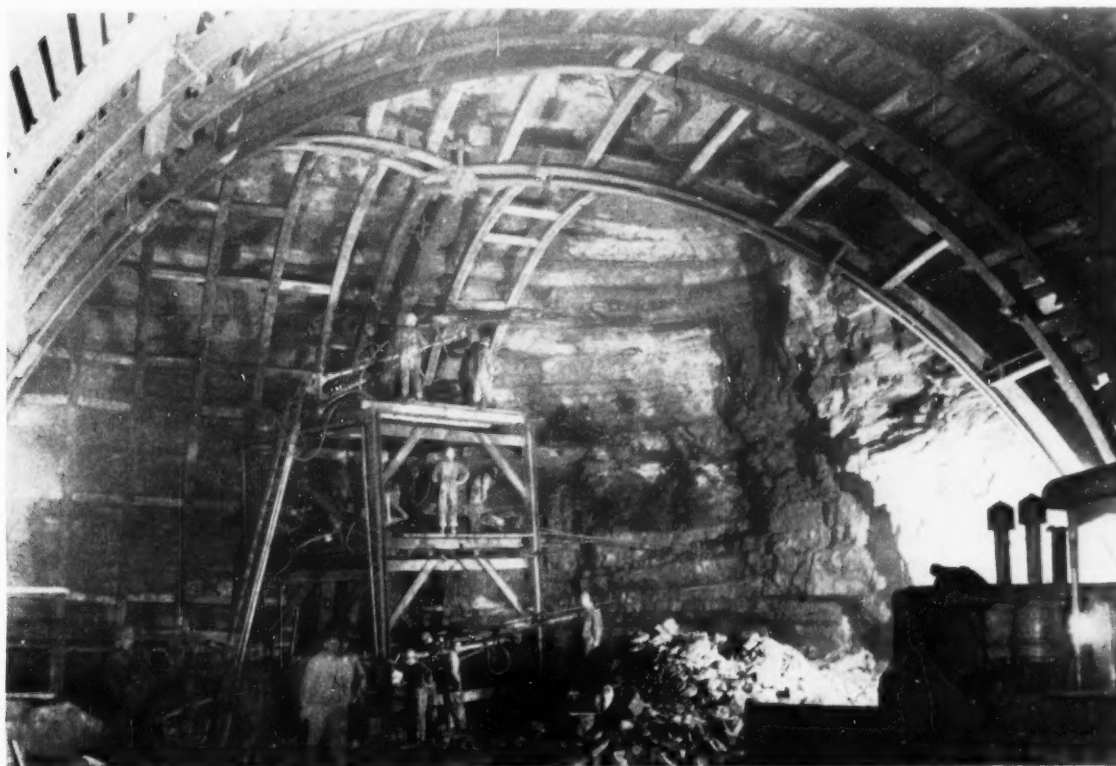
(Continued on page 66)



FEATURE OF HOISTING ARRANGEMENT is 20-ton capacity cage (left) capable of handling biggest equipment in the hole—including Northwest 80D shovels when dismantled. Here is a big Ford truck loaded with large chunk of rock too big to pass through skip loading



gate of shaft bottom. At right is close-up of 11-yd skip discharging into 150-yd muck bin at surface. Note that air-operated radial gates on muck bin open from top, preventing blocking up in chutes. Bin, skips and cage were built by E. Long Ltd., Orillia, Ont.



INTERSECTION OF CROSS-DRIFT from bottom of shaft and main tunnel top heading required some tricky design in steel roof sup-

ports. This groin arch was the answer. Main heading is just being turned by drilling from temporary jumbo.



TOPPED BY 7-FT SHEAVES, these headframes rise 120 ft above shaft collar at Shafts 3 and 4. Sheave loads are carried by cantilever extending over shaft area from heavy A-frame main structure, requiring only light cage guide steel below cantilever. Muck bin at side, holding 150 cu yd, is receiving another 11-yd skip load of muck.



SHUTTLING back and forth from shafts to dumps, these 16-yd Marion semi-trailers work with Ford Big Job tractors, get rid of millions of yards of muck.



ONE OF NUMEROUS time-saver tricks is loading roof support ribs, timber blocking, drill steel and other supplies needed below with Clark fork lift truck on special trailers that are lowered into headings by shaft cage and hauled directly to point of use in tunnel below ground.

tractors under competitive bidding.

The original tunnel project, 4.8 mi of single tube driven from four offset shafts from 200 to 330 ft deep, was divided into two sections. Rayner-Atlas, Ltd., a Canadian firm, and the combination of B. Perini & Sons, Inc., Walsh Construction Co., and Canadian-American contractors, each were awarded half the job, with Rayner-Atlas to work from Shafts 1 and 2 (intake end) and Perini-Walsh from Shafts 3 and 4 (outlet end).

Later, the commission extended the tunnel 3,683 ft southward from the original inlet portal end to cut down the length of cut and cover pressure tube, and awarded this section with Perini-Walsh to drive it from a new shaft, known as No. 5.

Then last summer, with the change in plans to go ahead with stage II of the project, the twin tunnel, 250 ft riverward from the original bore, and to be driven from the same shafts, was awarded

to the same two firms in sections corresponding to their contracts on the first tunnel.

Thus Perini-Walsh is driving some 16,100 ft and 15,220 ft in tunnels No. 1 and 2 respectively, and correspondingly Rayner-Atlas is driving some 12,435 ft and 12,080 ft.

The tunnels lie just under a stratum of hard Irondequoit limestone which forms a sound cover for the big bores. The headings pierce various strata of dolomite, shale and sandstone. As they are designed circular in section, 45 ft finished dia with a minimum concrete lining 28 in. thick, they are running close to 51 ft excavated dia—and that's one great big hole.

According to specifications, the full length of both tunnels is being supported above springline with four-piece steel ribs made up of 8-in. WF beams spaced 4 ft apart. They rest on double I-beam wall plates which, in turn, are posted on timber struts in niches outside of minimum excavation line. The rib

sets are lagged with 6-in. light steel channels and/or 12-in. wide metal pans, and are further stiffened with timber spreaders. Back packing is limited to wood blocking.

Perini-Walsh started out with, and has continued to use, the heading-and-bench method of driving, taking out a little more than half the section in top heading, then down-drilling the bench after holing through a heading.

Rayner-Atlas started out with a modified full-face, using two drill jumbos, and excavating practically the full cross-section in one operation. This scheme was abandoned, however, mainly because of inability to get at and bar down a treacherous formation of dolomite lying just under the high roof.

Consequently, they revamped their operations to follow closely those of Perini-Walsh. By now, except for some differences in hoisting, compressor and ventila-

(Continued on page 68)



ALTITUDE:

7,000 feet

SOIL:

85% rock

OPERATION:

Smooth

CUTTING into soil heavily laced with rock, in rarefied atmosphere at 7,000 feet, is no operation for balky, feeble engines. That's why a Caterpillar Diesel Engine was selected to power the compressor that supplied air to drill 400' of 2¼" hole daily near Henrieville, Utah. The job was 2½ miles of road construction.

The Cat D13000 powered a Gardner-Denver 365-cubic-foot portable air compressor, beating out steady power in this high altitude day-in and day-out.

"Caterpillar equipment stood up to these conditions. It's tops in work of this nature," reports A. H. Cranmer, superintendent of Whiting and Haymond, contractors on the job. "And the dealer takes care of us in grand shape. There will be no shutdown because of lack of parts."

Just as important as their dependability is the economy of Caterpillar Diesel Engines. They operate without sputtering or dying—without fouling in any way—on low-cost No. 2 furnace oil.

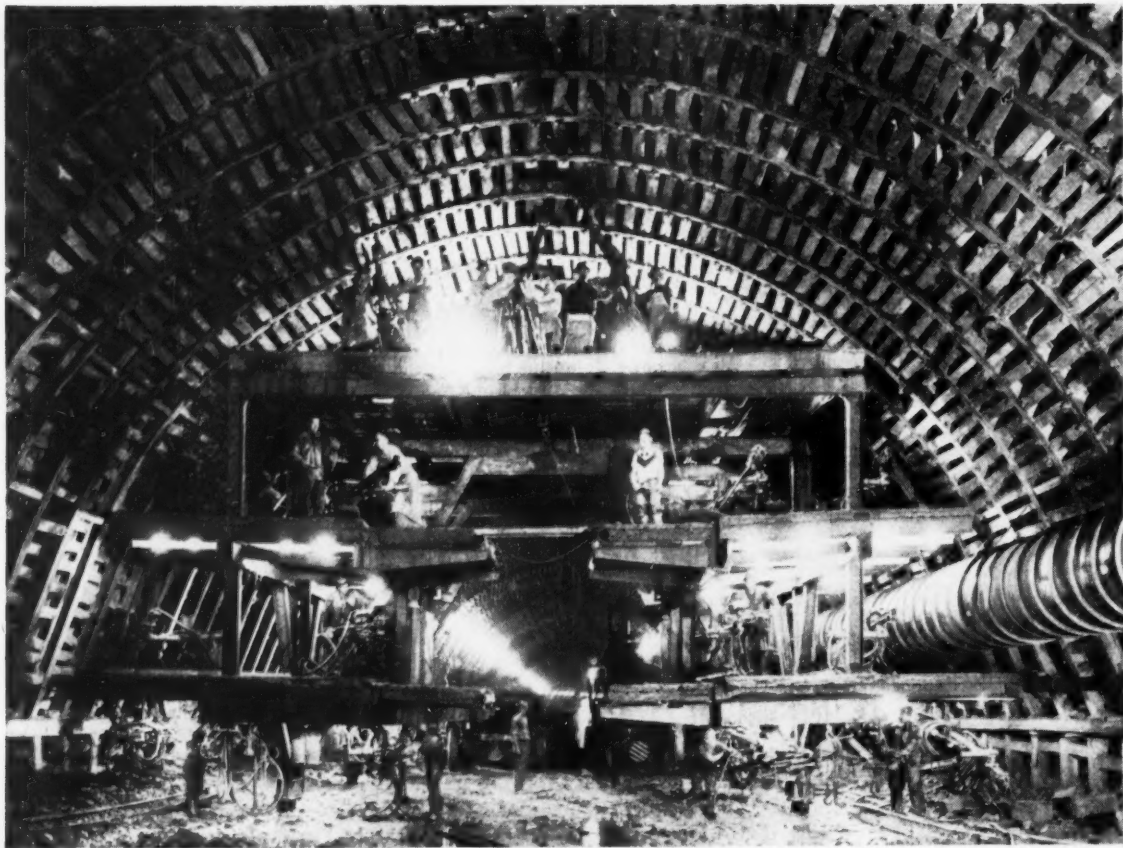
Caterpillar Engines are available in machines built by leading equipment manufacturers. Be sure to *specify* Caterpillar power in the equipment you buy.

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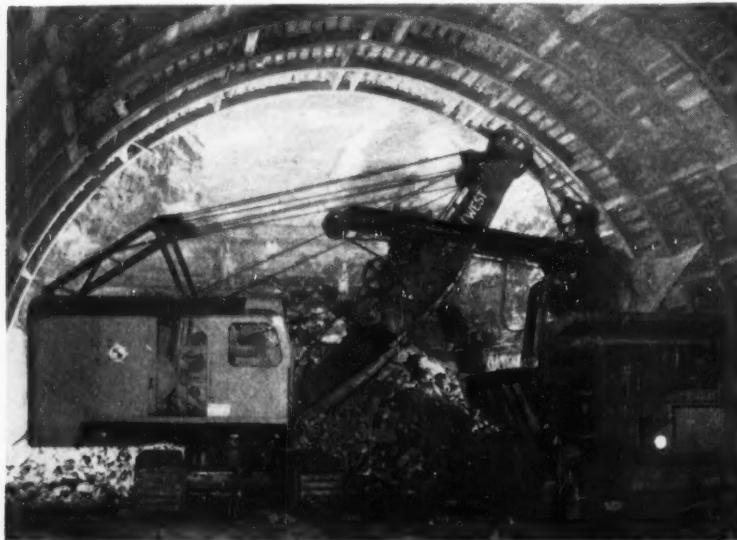
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**Diesel Engines
Electric Sets**



HEAD-ON VIEW of jumbo shows location and spacing of 17 Joy drifters mounted on Joy hydraulic booms. Three drills are suspended from, and two are mounted on top of, each bottom deck wing. Two more drills are on each center deck wing, and three are mounted on top of upper deck. Center wings of bottom and middle decks

can be dropped to clear mucking shovel and trucks. Four-section steel ribs are spliced into two sections in tunnel, placed on top of jumbo and erected during drilling operations, along with struts and steel lagging. Vent pipe is 10-gage steel, 48-in. dia fastened to ribs by strap steel.



NO USE SENDING A BOY to do a man's work, so Perini-Walsh mucks out the top headings with electrified Northwest 80D shovels with dipper sticks cut down to 13 ft. handling a 3½-yd bucket. And there's still room in the big hole to load into 13-yd Euclid diesel end-dump trucks that haul the muck to skip-loading bins at bottom of shaft. Each top heading round produces about 1,200 cu yd of loose muck, loaded out in an average of 4¾ hr.

tion equipment, the two jobs are very much alike. The detail job operations described from here on are those of Perini-Walsh.

Key to fast driving of these big tunnels, as we see it, is an excellent shaft and hoisting arrangement capable of efficient handling of big equipment, heavy steel sections and tremendous quantities of muck. The set-ups at Shafts 3, 4 and 5 are identical.

Each headframe, containing 250 tons of steel, is designed as a broad-topped A-frame, 120 ft high and flaring out to 55x58-ft in plan at ground level, set alongside the shaft. Unique in the headframe design is the fact that the sheaves are supported by a cantilever frame extending out over the shaft, taking all the load off the shaft lining.

A light guide tower rises from shaft cellar to the cantilever frame. Steel deck supports salvaged from the Toronto subway make up the main headframe members, some of
(Continued on page 72)

The bigger the job... the more important it is to control your aggregate supply

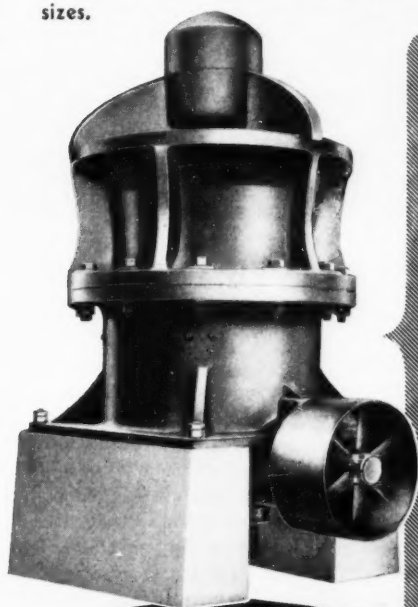
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2. Traylor original, self-tightening Bell Head and Curved Concaves, made of manganese steel.
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4. A positive and automatic force-feed lubrication system, with water-cooled oil reservoir.
5. Machine-cut steel gearing.
6. Self-contained countershaft bearing, fitted with roller bearings and automatically lubricated.
7. An all-around bottom discharge, without diaphragm.

All these features are illustrated and fully described in Bulletin 7112. To see how you can get better aggregate . . . as you need it . . . send for your copy today.



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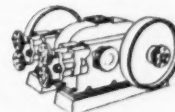
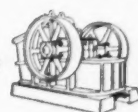
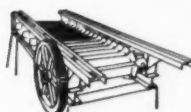
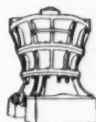
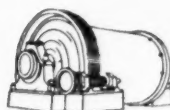
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You can get on the job early this year if you equip at least one tractor on each project with a Hyster Towing Winch (individual job requirements will determine the number of winches required). The winch's powerful line pull, plus the tractor's mobility, **makes sure all** your equipment is working **all** the time. With downtime kept to a minimum, maximum profits are assured.

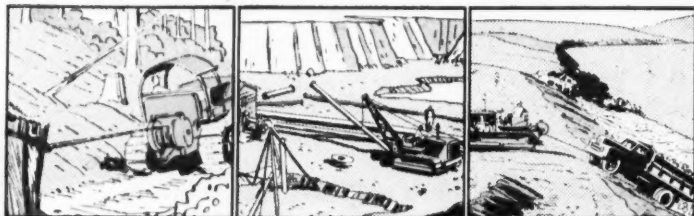
Winching heavy equipment through mud, out of bog-holes and over swampy ground requires mobility, reach and pull. Long reach and mobility enables the tractor to walk to firmer footing where full engine power can be applied **through**

the winch to the load. **A Hyster Towing Winch greatly increases tractor pull—by as much as 90% over drawbar pull.** That's why contractors depend on Hyster Towing Winches to keep all kinds of construction jobs on schedule.

Hyster Towing Winches are rugged and dependable for heavy duty service. They are specifically designed for "balanced", matched mounting on Caterpillar-built tractors. See your Caterpillar-Hyster dealer for information, or write to:

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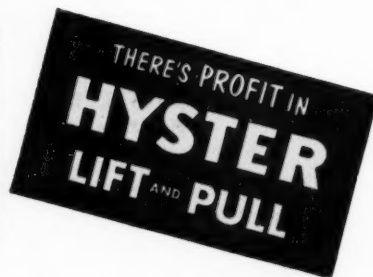
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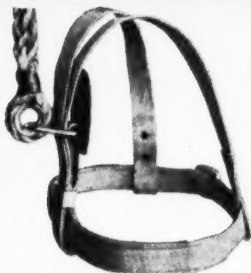
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Flexible, rugged, yet comfortable on the job. Ideal for close quarters. Available in all three types of webbing. All Dee Rings are equipped with metal liners of 20-gauge galvanized steel. All sizes.



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a single source for
all your Safety Belts



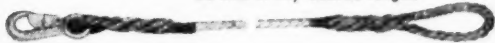
M.S.A. HARNESS TYPE WEB SAFETY BELTS

This type of belt gives extra body support, and the adjustable shoulder straps distribute the weight more evenly—available in genuine leather or webbing.



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Strong belt anchor made of light flexible steel cable with drop-forged snaps at both ends. Quick to attach or release. Standard cable is 6 feet long, but may be had in any desired length.



LANYARD

Available in 1/2", 3/4" or 1" rope with drop-forged snap at one end, loop at other, or any combination required. All splices have four tucks, wrapped ends. Furnished in any length desired.

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his job is to help you.



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Because there is no *one* safety belt that gives the best protection for *every* job, matching the belt to the need is all-important.

You get this *selection* advantage at M.S.A. Our complete line of safety belts lets you satisfy your specific requirements for safety belt protection . . . you get the belt that's built for the job.

You'll be interested, too, in the materials available. M.S.A. Leather Safety Belts are made from the highest grade harness leather, inspected and tested. *Diamond-Stripe Webbing Belts* are tough, yet comfortable, and are tested at 4,500 to 5,000 pounds. *Straco Web Safety Belts* have a tensile strength of 2,800 to 3,600 pounds. Both these materials are treated to resist moisture, mildew and the effects of paint. *Neo-Web Belts*, made of high tensile woven cotton webbing, and molded with a mixture of neoprene and special rubber, for chemical resistance, are tested at 2,800 to 3,200 pounds. All hardware on M.S.A. Safety Belts is tested to 5,000 pounds.

Get the facts on our complete line now. Our bulletin gives manufacturing details, describes and illustrates all M.S.A. Safety Belts. Write for your copy.

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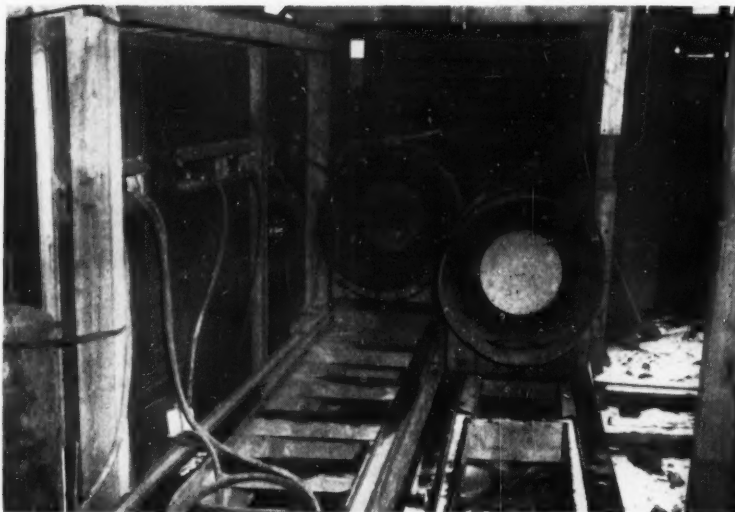
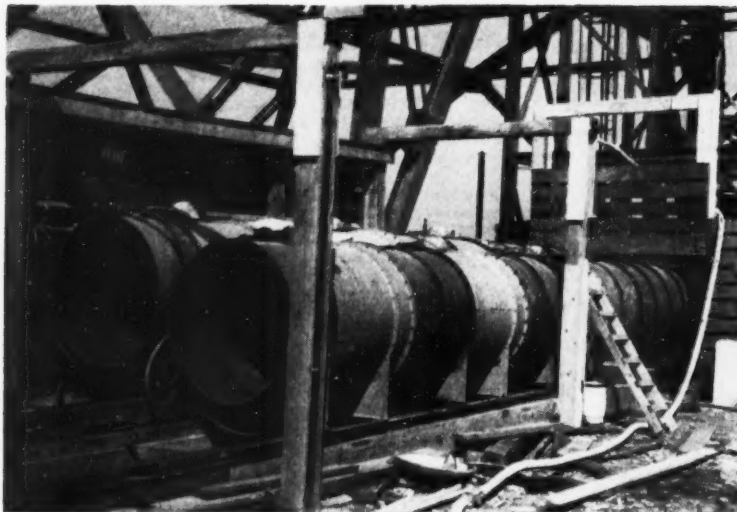
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A NEW IDEA in tunnel vent fans are these Joy Axivane units that can be added as needed in tandem series and make up into 48-in. line, same as vent pipes and risers. Each unit is driven by its own 75-hp motor, and all are reversible for suction or blowing. Series of four fans can put 65,000 cfm into one heading.

which are heavier than theoretically required—but they were available.

The shafts, of 26-ft internal dia, are fully lined with concrete above rock and partially lined in rock. The center area is taken up with a counter-balanced cage 9 ft 3 in. x 22 ft, and 12 ft high with bonnet roof, capable of handling 20-ton loads. At one side is a pair of 14-yd balanced muck skips. The opposite side of the shaft is filled with two 48-in. steel vent-pipe risers, a manway ladder and the cage counterweight well.

These cages handle everything up to 13-yd Euclid end-dump trucks used for muck haul in the headings. Timbers, steel ribs, 48-in. steel vent-pipe sections, drill

steel, drills and miscellaneous supplies are loaded on special trailers by Hyster fork lifts for transportation down the shaft and to the face or point of use in the hole.

Dynamite trucks loaded with a complete round of powder are lowered down the shaft and run right up to the face. Tractors and Eimco loaders used for muck clean-up also ride the cage. Even the 2½-yd Northwest shovels used for mucking were taken into the tunnel in sections via the cages.

The two Lidgerwood-Mundy electric hoists at each shaft are beauts. Both are equipped with 8-ft drums and 2¼-in. hoist cable. One, handling the counterbalanced cage, is driven by a 300-hp General Electric motor. Two lines are car-

ried on each drum, one unwinding as the other winds.

On the cage hoist one line goes to the cage, the other to the counterweight. Lines from the skip hoist go to the two skips, thus keeping them in balance. The skip hoist is driven by a 450-hp GE motor. All hoist signals are duplicated in buzzers and lights. There is also telephone communication between top and bottom of shaft.

The full section runs 75¼ cu yd of excavation per ft of tunnel. In driving by the heading-and-bench method, Perini-Walsh takes out 44 yd per ft from the top heading, placing the heading floor just below springline to allow setting the rib supporting posts. Tunnel center lines are 250 ft apart, with the shafts in between.

Shafts Serve Both Tunnels

First step in attacking the headings was to drive arch-roof cross-cuts from shaft to tunnel lines, with roof supported by steel ribs. These were driven at same grade as the top headings. The steel rib system at intersection of cross-cut and main headings is a masterpiece. Ontario Hydro engineers, the contractors and T. L. White of Commercial Shearing and Stamping Co. all had a hand in the design, and they came up with a beautiful groin arch design.

After the top headings were turned, two drill jumbos were set up in one tunnel, to drive in opposite directions. Some of the top headings have been holed through, and these jumbos were returned to the shaft and set up in the parallel tunnel for the same driving process.

The jumbos are 3-deck steel frames, mounted on 28-ft-gage track. Top deck is solid, but the two lower decks are split with inside aprons that drop to clear the mucking shovel and trucks. Each jumbo carries 17 Joy T-350 (3½-in.) wet-type drifters, mounted on Joy chain-type LW-6A feeds driven by a 4-cyl reversible Pistonmoter. The feeds, 10 ft long, take 8-ft steel changes.

Each drill and long feed is mounted on a Joy Hydro-Drill-Jib, with power lift and power swing, so attached as to permit inverting the hydraulic power jibs when drills and booms are suspended from bottom of lower deck. Hydraulic pressure for the jib booms is supplied by two Joy unitized pumping systems located on the middle deck. Main booms are 10 ft long, power booms are 8 ft, which

permits each drill to cover an area 7 ft 9 in. in diameter.

A storage, supply and working platform at rear of jumbo is raised and lowered by an Ingersoll-Rand 7½-hp tugger hoist. The jumbo design permits the steel ribs, fabricated into two sections in the tunnel, to be hoisted in advance to the top deck, then to be placed during drilling operations—a big time-saver. The jumbos are moved by a tractor.

There is no rigid pattern for drilling the top heading, but so far the average round has been 144 holes with a horizontal V center cut, pulling 15.7 ft. Most holes are drilled 16 ft deep, but rim holes and relievers are put down 20 ft to keep the face on an even plane—otherwise the corners would not pull and the face would become concave.

Powder is Canadian Industries Ltd. Driftite semi-gel, fired in delays up to 15. Each round pulls 700 cu yd of solid rock, breaking up into about 1,200 cu yd loose muck. Average powder yield is 2.75 lb per cu yd of solid rock. Drilling is mostly with Timken carbide insert detachables, sharpened by grinding on the job, though some Liddicoat throw-aways are used.

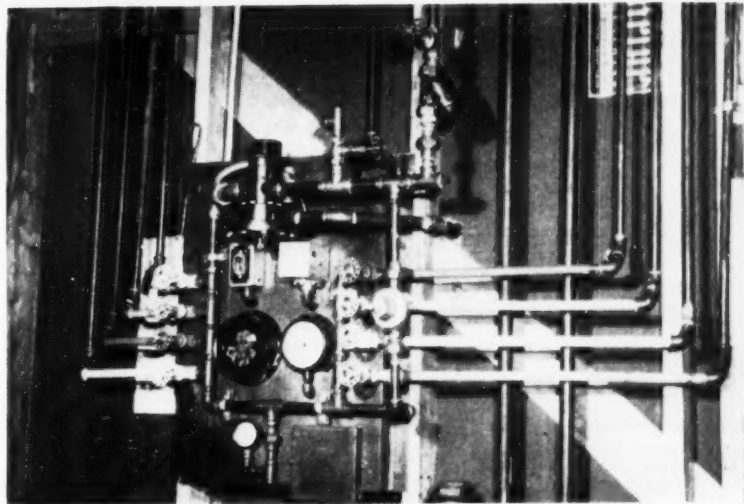
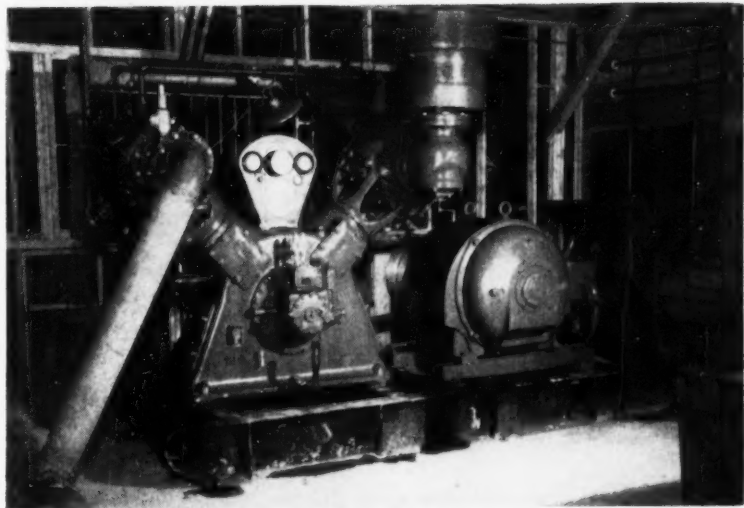
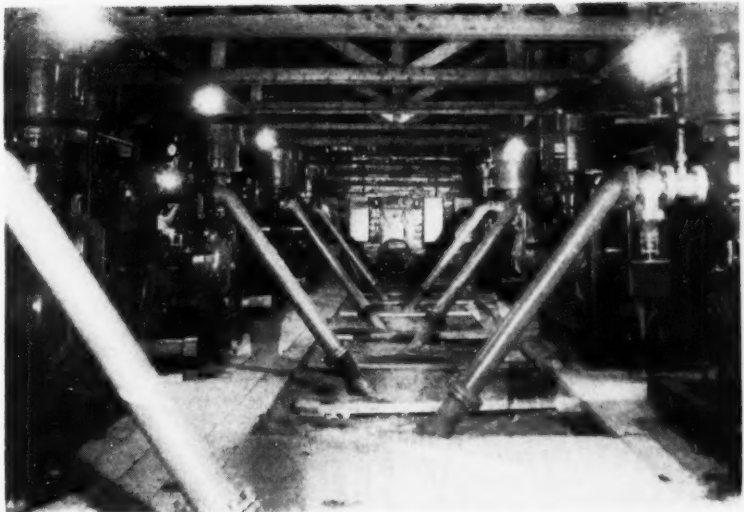
Mucking Procedure

Mucking out is by a Northwest 80-D electrified shovel in each heading, powered by a 100-hp motor and equipped with a 3½-yd bucket and short dipper sticks. Muck is loaded into 13-yd Euclid end-dump trucks for haul to the shaft bottom. An Eimco 1-yd rocker shovel on a Caterpillar D4 and an Allis-Chalmers HD20 bulldozer assist in muck clean-up. The time cycle of drilling, mucking and steel setting is given in the table on page 80.

All diesel trucks and tractors assigned to steady duty underground are equipped with exhaust scrubbers.

The muck hoisting arrangement works like a charm. The shaft bottom was carried to ultimate tunnel floor level, well below the top heading level. Then muck storage bins and skip pockets were sunk up to 75 ft below tunnel bottom. During top heading operations, the muck bin shaft was boarded up to top heading floor level, giving an additional storage capacity.

The Euclids dump into this storage bin. Then the muck, controlled by air gates, goes into a 12-yd measuring hopper for discharge



FLEXIBLE COMPRESSOR LAYOUT is furnished by battery of 6 to 10 semi-portable Joy 750-cfm units at each shaft. Each unit is belt-driven by 150-hp electric motor mounted integrally with compressor on steel skids. Units require no special foundation, and are set or removed in few moments with a crane. Control and other piping for each unit is painted a distinctive color for identification, as shown in bottom view.

COMMENT

from the
BUTLER ENGINEER

Engineer Stripped to Underwear!

Sub-zero here today. Paradoxically it reminds me of a devilish hot day last summer. I was building a new home. So I order the first load of ready mix for my footings. Thought I had arranged for a couple of men to come out with the transit mix truck to handle the pour. My only job would be to sign the receipt — so I am in business clothes.

In comes the concrete but no men. Obviously we have to pour — right then! For the next two hours I'm busier than a chameleon on Joseph's coat. I guide the spout. I shovel concrete. I puddle it and place the reinforcing. And I do the surface finishing.

First, my coat comes off. Then my shirt. Then my pants. I end up clad only in the lower half of my unmentionables — and even then the sweat pours into the mix so fast it becomes a slurry.

Well, anyway you can't beat concrete batched in a Butler Plant and mixed with sweat from the Butler Engineer. But usually the sweat comes first — before the Plant is built.

1953 will reach a new and higher high in road construction. Think of the immensity of the Ohio Turnpike. 57 contractors on that one job alone. But compared with new highways, relocations and the like, all over the nation, the Turnpike is like an inch to an ell.

All in all, gentlemen, it's a lot of yardage — and a hell of a lot of Butler Plants.

Be seeing you — on those jobs.

The Butler Engineer

BUTLER BIN COMPANY
WAUKESHA, WISCONSIN



BATTERY of 13 drifters on platform jumbo keeps well ahead of shooting and mucking operations in down drilling the bench.



MAINTENANCE AND REPAIR are big items on this big job. The thousands of feet of electric cable required on the project are kept in repair by two Joy cable vulcanizing machines at each shaft.

into the alternate skips. As the skips are balanced, one goes up as the other goes down.

At the surface the skips dump automatically into a 150-yd storage bin alongside the headframe. This bin, also equipped with two air gate chutes, loads into trucks. These radial gates open from the top instead of the bottom, which prevents the muck in the chutes from arching over and blocking.

Muck haul is by Euclid end-dumps and Ford Big Job trucks equipped with Marion 16-yd semi-trailer dump bodies. Disposal is in designated areas from 1 to 2 mi from the shafts, and here ravines

are being filled in to form beautiful level ground for parks or building sites.

The big holes need a lot of ventilating air, and they are getting it with a very efficient fan layout. Both in the shaft risers and in the top headings, the vent pipe is 48-in. dia, of 10-gage steel with angle iron stiffening ribs 2 ft apart. Pipe lengths are 20 ft, and are connected by Naylor band couplings. In the heading the pipe is held high on the steel ribs by steel strap bands. At 100-ft intervals a safety cable is looped around the pipe just in case the band clamps should slip.

(Continued on page 76)

NOW! the great new **OPEN BOWL TERRA COBRA**

FIRST WITH 10-SPEED TRANSMISSION

First 2-wheel tractor units to offer proper power to speed ratios for highest production under all job conditions!

WITH SPEEDS TO 35 MPH

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WITH STABILIZED 90° STEER

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PLUS THESE ADVANCED FEATURES:

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- High tensile alloy steels
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18 yard capacity 225 HP engine

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With speed ranges never before available in 2-wheel-tractor-propelled scrapers, the new Terra Cobra 142 offers speeds to 35 MPH plus more gradability. Stabilized 90° steer, higher clearance and lower center of gravity give greater maneuverability in tight places and rough ground. Simple finger-touch remote controls, good visibility, and latest foam rubber cushioned seat increase operator efficiency and comfort. Big low pressure tires combine high flotation and carrying capacity. Extra ruggedness keeps 'em rolling. Simplicity reduces servicing. Let your Wooldridge Distributor show you today why the new more versatile Terra Cobra 142 can handle more jobs per year—earn more profits per job.

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Terra Cobra



Terra Cobra
Wagon



Power Control
Unit



Scraper



Ripper

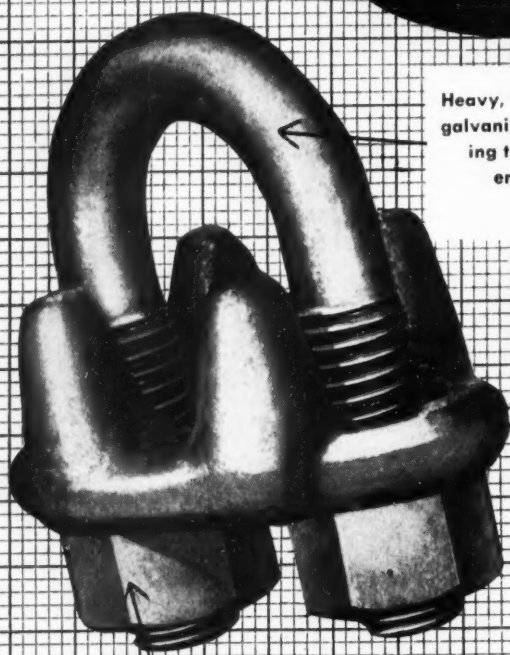


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ONTARIO HYDRO TUNNELS

. . . Continued from page 74

At top of each shaft are two sets of fans, each connected to one of the risers. These are groups of Joy Axivane fans, set horizontally in tandem within 48-in. casings that hook into the regular vent pipe. Each fan is driven by an individual 75-hp direct-connected motor operating at 1,750 rpm.

For every advance of 800 ft of heading another fan is added to the series, up to a total of five. The fans are reversible, and can be cut in and out as needed. Top air supplied to each heading is 65,000 cfm. When a heading is holed through between shafts, artificial ventilation is no longer required, so the vent piping is transferred to the parallel tunnel.

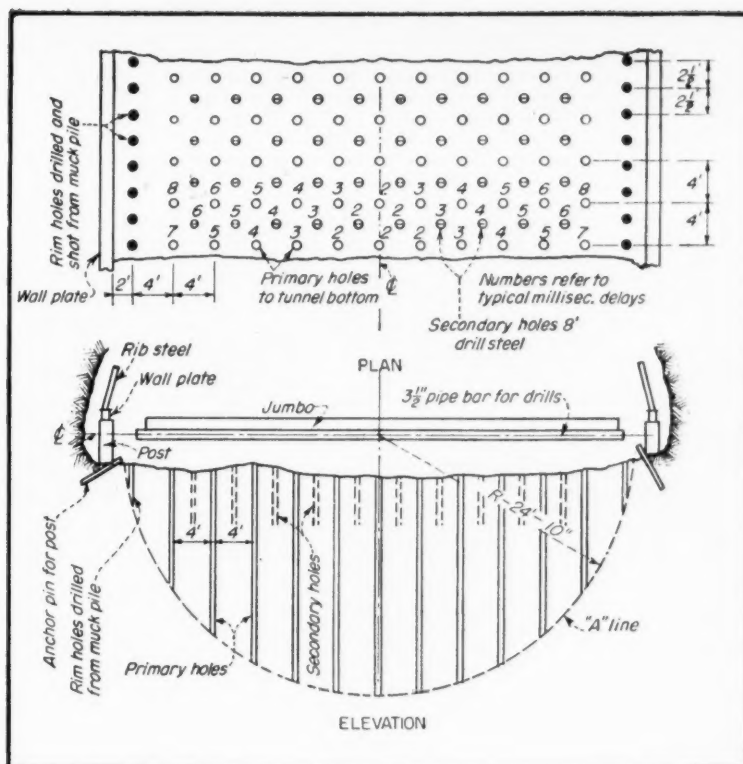
The compressor set-up also is unusual. Instead of installing big stationary compressors as is customary for tunnels of this size, Perini-Walsh selected Joy WN-102 semi-portable units, each delivering 750 cfm. These are arranged in banks of 6 to 10 at each shaft, depending upon how the headings work out, and can be moved easily from one shaft to another.

Most of these units are driven by 150-hp electric motors, but a couple of spare units are belt-driven by Caterpillar 17,000 diesel engines. These compressors need no special foundations other than a concrete sill on the house floor slab and they can be cut in and out as air requirements change. All piping, control and otherwise, for each unit is painted a distinctive color for easy identification.

Bench Excavation

An entirely different scheme of drilling and shooting is being used on the bench—downhole and millisecond delay detonation. This method was planned from the first, but the contractors did a lot of experimenting before they finally worked out all details to their full satisfaction.

Key to this operation is a horizontal frame jumbo spanning full width of the bench, with a pipe bar along one side. On this bar are mounted Joy drifters to act as wagon drills for down drilling—12 mounted in section 3 and 13 in section 4. At each end of the jumbo is a rail that engages track rolls suspended from the rib steel overhead, set to exact grade. The platform is moved ahead by a 7½-hp tugger hoist. Two smaller tuggers work in the opposite direction as snubbers and to aid in lining up the rig.



DRILLING PATTERN for bench excavation. Platform jumbo, subsuspended from ribs, carries 12 and 13 Joy drifters acting as wagon drills for down drilling. Primary pattern of holes drilled to bottom contour is 4x4-ft grid, except rim holes are drilled and shot from muck pile. Secondary holes are drilled with 8-ft steel to prevent top rock from breaking out in chunks too big to handle. Shooting is by millisecond delays in V-pattern as shown in plan.

The primary drill pattern is 12 and/or 13 holes spaced across the tunnel in rows every 4 ft. This pattern does not include the outside rim or trim holes, as experience has shown it is best to drill these short holes 2½ ft apart longitudinally from the muck pile and shoot them in a secondary blast.

With the drill bar at constant elevation, and the drills in the same transverse position for each row of holes, it is easy to figure the depth of each drill hole to follow the circular bottom contour of the bench. But experience again showed that even with the fairly close 4x4-ft grid pattern, the upper part of the bench was breaking up into blocks too large to handle. To remedy this trouble, they now put down 8-ft secondary holes in another 4x4-ft pattern staggered both ways between holes in the primary pattern.

At the inception of the bench operation it was assumed that drilling could proceed constantly far ahead of shooting and mucking. This was tried but had to be abandoned because many holes were lost due to relieving of rock pres-

ures. The present procedure is to drill and shoot the amount of muck required to keep excavation going with the least amount of interruption. As many as 25 rows were shot in a round. Shooting is by millisecond delays in a V-pattern, as indicated in the above diagram.

Mucking out is by the same Northwest 80-D shovels used in top headings, loading into the 13-yd Euclid end-dumps. Enough muck has to be left on the curved bottom to form a decent haulageway.

So much for the main tunnel driving operations. Subsequent articles will describe raising the intake and discharge ends from tunnel grade to the canals, and placement of concrete lining.

Sir Adam Beck No. 2 development is under the general direction of Robert Saunders, chairman, and Richard L. Hearn, general manager and chief engineer, of The Hydro-Electric Commission of Ontario. At the project key personnel include Gordon Mitchell, project manager; W. L. Fraser, field project engineer; William Hogg, assistant project engineer; (Continued on page 80)

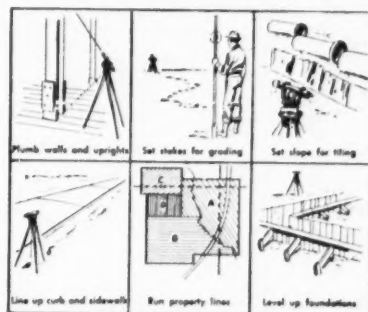
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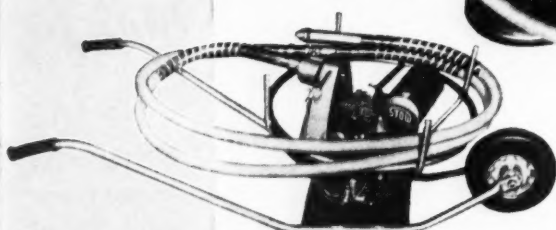
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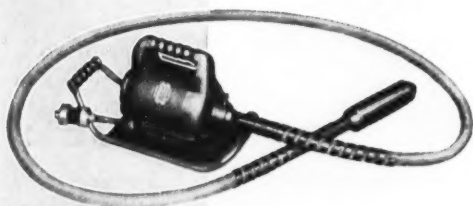
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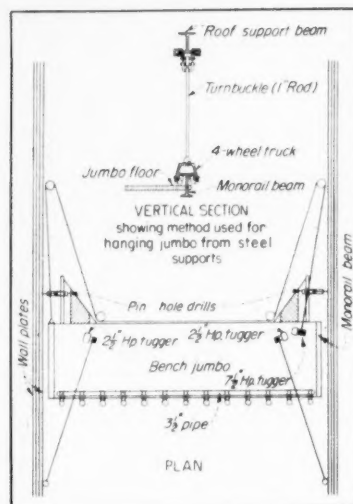
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ONTARIO HYDRO TUNNELS

. . . Continued from page 77



BENCH JUMBO is moved, positioned and steadied by lines from 3 air tugger hoists as shown here. Holes for pins anchoring roof rib posts are drilled from wings at rear of jumbo.

and L. J. Gallagher, general construction superintendent.

The Perini-Walsh combine includes: B. Perini & Sons, Inc., Walsh Construction Co., Morrison-Knudsen Co. of Canada, Ltd., Mannix, Ltd., C. A. Pitts General Contractor Ltd., Arthur A. Johnson Corp., and Henry J. Kaiser Co., with Perini as sponsor. Jesse R. Glaeser, vice-president and chief engineer of the Perini Company, is project manager, assisted by Alex Simpson, general superintendent P. M. Putnam, chief engineer; A. J. Ray, office manager; Marion Brown, John Doherty and Lloyd Owens, shaft superintendents; Tony Casali, master mechanic; and L. Greaves, master electrician.

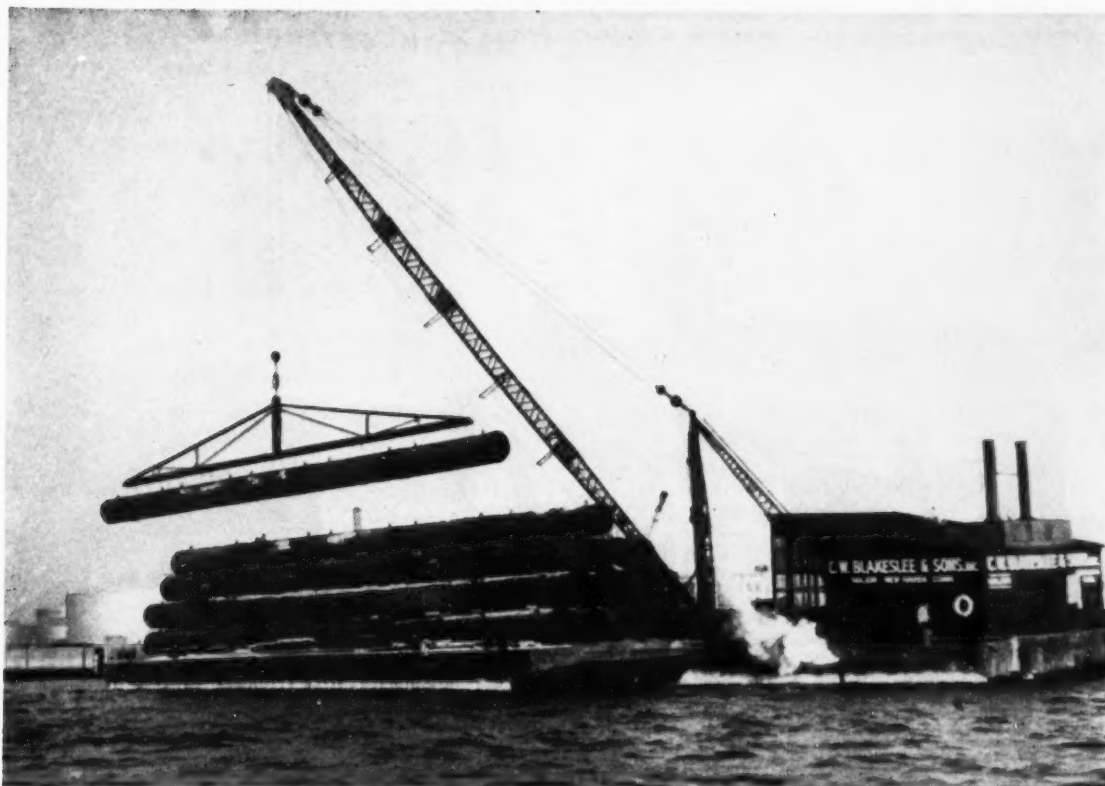
Average Time Cycle Top Heading Driving

Average advance—15.7 ft
Average holes per round—144
Average time of operations:

	Hr.-Min
Drilling	3-09
Setting ribs*	0-26
Load and shoot	0-57
Smoke out	0-39
Mucking	4-45
Set jumbo track and wall plate	1-10
Miscellaneous	0-17
Delays	0-16

Total 11-39

*Most of steel set during grilling.

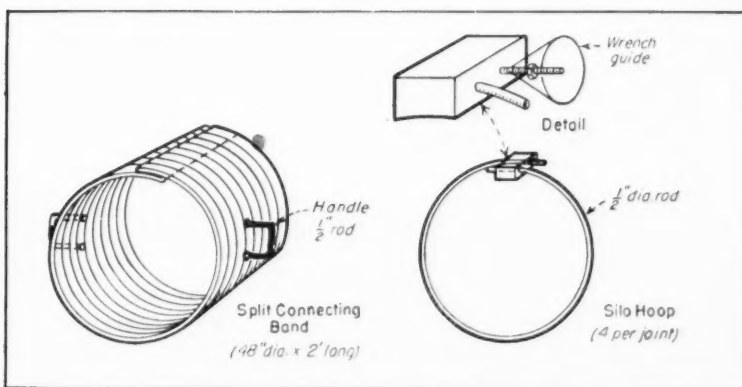


CORRUGATED METAL PIPE in 100-ft lengths is supported by 90-ft strongback and lowered by derrick boat to be coupled under

water by divers. Pre-assembling 20-ft pipe into these longer lengths saved divers much work, as did remote release gear on strongback.

Simple Procedures Help Divers Place Sewer Outfall

By JAMES H. GILBERT, C. W. Blakeslee & Sons, Inc.



COUPLING DETAILS that helped divers join pipe sections together are handle welded to connecting band, and light-gage metal funnel to guide wrench that tightens band's hoops.

ON THE BOTTOM of the harbor at New Haven, Conn., is a new 1,600-ft sewer outfall of 48-in. corrugated pipe. Placing it as much as 35 ft below water surface was divers' work. But local contractors C. W. Blakeslee & Sons, Inc., minimized the submarine labor by such things as pre-assembling the pipe into longer lengths, rigging the lowering gear with an above-water release, and devising guides for the wrenches that tightened the joints.

Borings taken along the proposed line had indicated that a coarse sand could be expected at the depth the pipe was to be placed. A number of pipe designs were considered, with Armco corrugated pipe being selected because of savings in cost and ease of laying. As this pipe has some degree of flexibility, it was not necessary to design a complicated or expensive support—it could just be laid with no support other than the existing sand.

First operation on the 1,600-ft outfall was to dredge out for the line. Approximately 40,000 yd of material was clammed out by New England Dredge & Dock Co. at a rapid pace because no rock was encountered.

(Continued on p. 84)

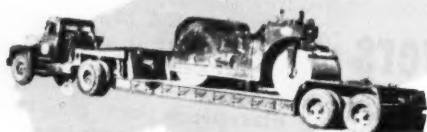
Let your
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prove you can load any equipment

FASTER...
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ON A MARTIN "FOLDING GOOSENECK" TRAILER

Proof...



From On-the-Job Performance!

The roller, shown above, is climbing the ramp of a Martin F3T "Folding Gooseneck" owned by Radory Construction Corp., West Hemstead, New York. John Rath, president of the firm, says, "This trailer has seen constant duty transporting our asphalt distributors, dozers, loaders, cranes, etc. and maintenance expense has been nil. We'd recommend the trailer to anyone for performance, dependability and *time saved in loading and unloading.*"

Whatever equipment you use, you'll load it in **LESS** time and with **LESS** risk on a Martin "Folding Gooseneck" Trailer. This is the trailer with the neck that unfolds, under cable control, forming a strong, broad, gently-inclined ramp that **ANY** rig can climb. The neck is lowered, equipment loaded, trailer raised and truck ready to go in an average of **4 MINUTES . . .** and one man does all the work! The low platform offers a groundlike stability that keeps equipment riding safe and secure.

Your Martin-Caterpillar Dealer can prove that the "Folding Gooseneck" is the fastest loading, safest hauling, most profitable trailer for moving **ANY** of your equipment. Ask him for real proof today!

KEWANEE, ILLINOIS

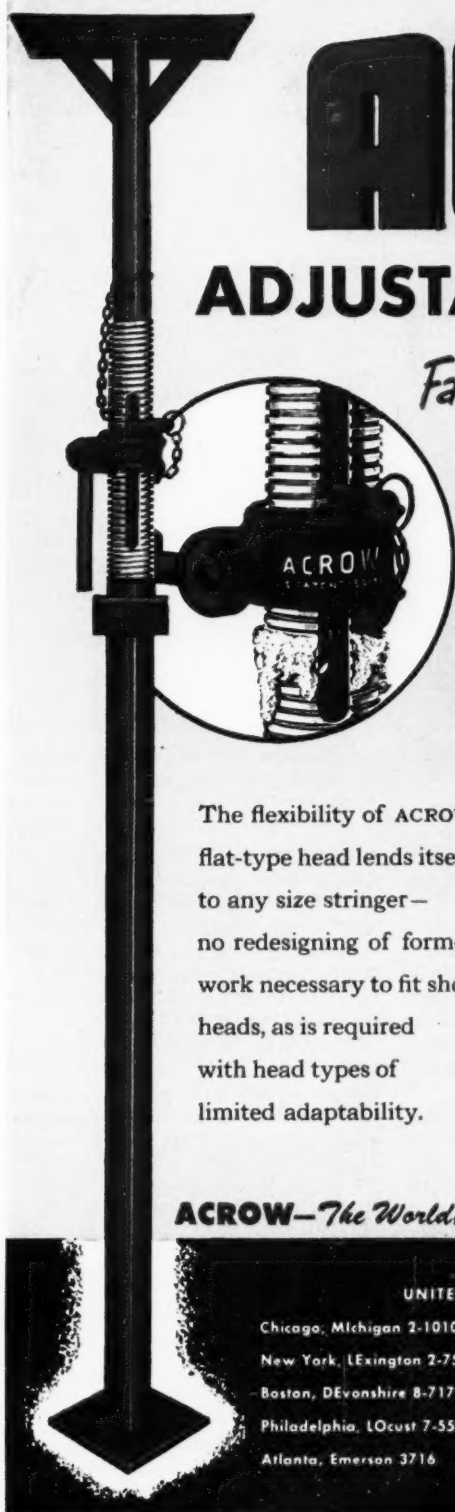
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Trailer

Standard 6" x 6"
Beam Type 14" x 4", and
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Fast 1,2,3, and they're up...



The flexibility of ACROW's flat-type head lends itself to any size stringer—no redesigning of form-work necessary to fit shore heads, as is required with head types of limited adaptability.

1
Lift Inner Tube to Desired Height



2
Insert Steel Pin



3
Turn Handle for Final Adjustment



- One Man Does the Work of 2
- Micro-fine, Positive Adjustment Working Ranges From 3'4"—15'
- Safe Working Load Fully Established and Guaranteed
- No Extra Attachments Required for Operation—Self Contained Unit
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CONCRETE OUTFALL CHAMBER weighing 47 tons is readied for lowering 35 ft to bottom of New Haven (Conn.) harbor, handled by job-built frame of 12-in. H-beams. Rest of 1,600-ft sewer line will be joined to 8-ft length of 48-in. pipe already built into box wall.

While the dredging was in progress, a concrete outfall chamber weighing 47 tons was precast on a deck scow. As the lifting capacity of any one of the Blakeslee lighters available at the time was only about 20 tons, a special hoisting device had to be built to handle the chamber. It was in the form of a modified A-frame of 12-in. H-beams extending beyond the bow of a derrick boat. With this, it was possible to lift the box-like chamber from the scow deck, and lower it 35 ft below water.

The chamber was fixed into position at the edge of the navigation channel by four piles driven to refusal and fastened to the box by four sets of hoops extending from the chamber walls. After the piles were driven, divers cut them off level with the top of the box.

A number of methods were considered for placing the outfall pipe itself. It was finally decided to pre-assemble it in 100-ft lengths, lower them into position and connect them under water. Two divers would work as a team for this latter operation.

While dredging and chamber construction proceeded, the 100-ft

lengths of pipe were assembled on another deck scow. The Armco corrugated pipe—48 in. dia, 12-gage, asbestos-bonded, asphalt-coated, and with paved invert—was delivered in standard 20-ft lengths that were joined together by a 5-man crew aided by a derrick boat. Two-foot split connecting bands with four silo hoops insured tight and strong joints.

To handle the 100-ft sections, a strongback was made up. It consisted of a 90-ft long, 12-in. H-beam bottom chord member with a 6-ft H-beam king post and trusses of 6-in. angle iron. Six ½-in. wire-rope slings suspended the pipe from the strongback. One end of the wire rope was permanently affixed to the strongback, the other was fitted with a special job-made attachment that let the pipelaying crew free the cable connection by remote control. This eliminated the necessity of divers walking the length of the strongback some 35 ft under water to release the cables and detach the pipe.

Before each 100-ft section was sent down, one of the 2-ft split connecting bands was put on flush

with the end of the pipe. Its four silo hoops of ½-in. rod also were affixed, though loosely. After the pipe was lowered and butted against the previously laid section, it was necessary for the divers to slide the band ahead 1 ft to center it over the joint.

With only a small lap in the split band itself, with the silo hoops on, and with pipe and band both corrugated, moving the bands was quite difficult for the divers—especially working with gloves and 35 ft under. Therefore, two U-shaped handles bent from 2-ft lengths of ½-in. reinforcing rod were welded to each connecting band. With these, the divers had little difficulty in positioning the bands correctly.

The ½-in. nuts on the silo hoop rods were tightened with an Ingersoll-Rand air boring machine whose bit was replaced by a shank with a box-head wrench on the end. Some trouble had been expected on this operation in the semidarkness under water. Accordingly, before lowering the pipe with its band and hoops, each of the nuts was fitted with a guide for the wrench. This was a cone-

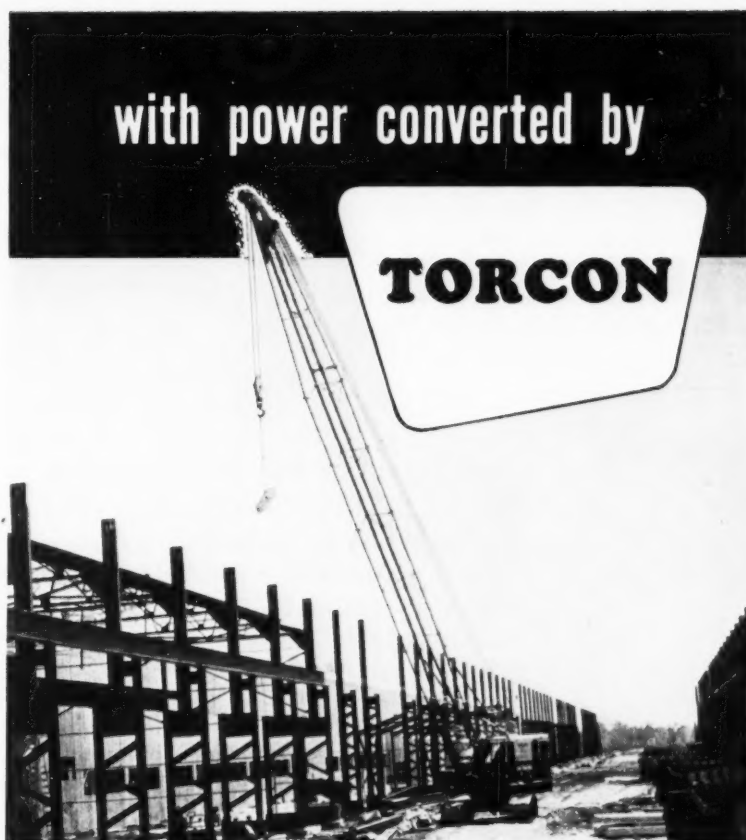
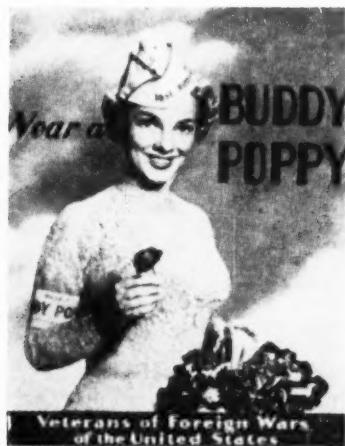
shaped light-gage metal funnel about the size of a paper drinking cup. The small end of the cone fitted over the nut and guided the air wrench to its correct alignment. Once the diver engaged the nut he removed the cone and proceeded with the tightening without any difficulty.

Disaster, Almost

One morning, with 75% of the pipeline already in place and the operation continuing smoothly despite an extremely heavy fog, a large 700-cu yd self-propelled mud scow loomed out of the mist. It narrowly missed the lighter and the air lines of the divers working below, and ran aground directly over the pipe. The scow's twin screws were only 2 ft above the pipe as she churned and hauled for 30 min before she finally broke loose. A subsequent investigation of the line showed that even though the supporting sand bed had been washed out from under the pipe for a distance of about 60 ft, the underwater joint in the middle of this unsupported length was perfect.

Job Personnel

The outfall is part of a multi-million dollar sewer expansion program that New Haven has been engaged in over the last two years. City Engineer Vincent Barry prepared plans for the job, on which Daniel J. Cahoon was project engineer for the city. The underwater installation was done by C. W. Blakeslee & Sons Inc., of New Haven. For the latter, Joseph Hepworth was construction superintendent and the writer was supervising engineer.

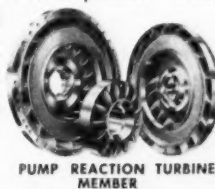


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Designed specifically for the "working class" of equipment, **TORCON** heavy-duty hydraulic torque converters can increase output up to 40%! They operate at high efficiencies over a wide speed range and permit engine horsepower to be fully used at all times.

TORCON transmissions eliminate shock to powered equipment, reduce operator fatigue, increase service life and provide unequaled operating economy. Available for use with gas or diesel engines rated from 30 to 600 horsepower — with or without cut-off clutch. They are designed for standard S.A.E. mounting and can be applied easily to existing equipment.

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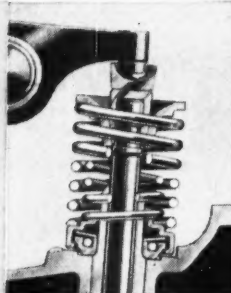
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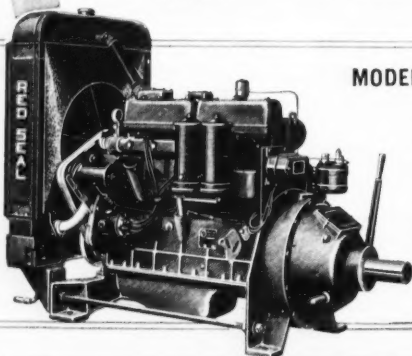


UNDERLYING THE USE OF CONTINENTAL RED SEAL ENGINES AS POWER FOR SO MANY LEADING MAKES OF INDUSTRIAL EQUIPMENT IS HALF A CENTURY OF UNCOMPROMISING STRESS ON ENGINEERING, AN EMPHASIS WHICH CARRIES THROUGH TO EVEN THE MINUTEST DETAILS.

Take the valve assembly in the cutaway view above. The inner and outer springs, you note, are wound in opposite directions, doing away with all possibility of pinching or interference when compressed. This detail, tiny in itself, typifies the countless "tremendous trifles" which combine with major engineering features to make Red Seal engines the dependable product they are.

As for these major features, the list is long and impressive. It includes the exclusive Continental system of individual porting . . . full-length water jackets . . . patented oil and dust seals . . . leakproof water pump . . . multiple cylinder-head studding . . . rifle-drilled oil galleries . . . balanced crankshaft with Tocco-hardened journals . . . and many, many more.

For performance, economy and stamina born of engineering leadership, and backed by parts and service facilities throughout the world, standardize on equipment with Continental Red Seal power.



MODEL R-600 OPEN POWER UNIT

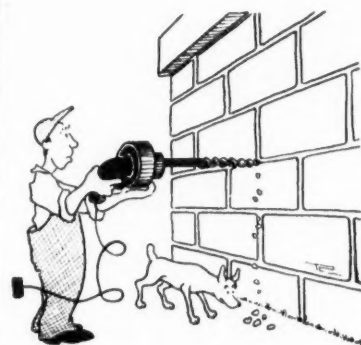
Six-cylinder, overhead valve design. Bare engine horsepower 192 @ 2400 r.p.m. Also available as closed power unit with sturdy sheet metal house with detachable sides. Other Continental Red Seal models from 14 to 277 horsepower for every type of job.

Continental Motors Corporation
MUSKEGON, MICHIGAN

How to Repair Leaking Masonry

Information from
Structural Clay Products Institute

PROPERLY CONSTRUCTED clay masonry walls are remarkably free of costly repair and maintenance, but the repair of a wall that has developed leaks because of poor initial workmanship or design is often difficult and expensive. Care in the selection and use of mortar, adequate flashing and tooling of joints will probably add only a small amount to the initial cost, but will insure a low maintenance overhead throughout the life of the property.



CUTTING MORTAR that is disintegrating can be done with power tools although care must be taken not to damage masonry units.

• **Tuck-Pointing**—Where the mortar joints have softened or disintegrated or large cracks are noted, it will be readily apparent that protective measures must be taken to correct or prevent leaky walls. This is done by cutting out all loose or disintegrated mortar joints for a depth of at least $\frac{1}{2}$ in., and repointing or filling with proper mortar. If the work is being done to correct leakage, all joints should be cut out in the affected area, as it may be very difficult in some cases to determine the defective joints by visual inspection alone. If no leakage has been noted and the repointing is being done as maintenance work, it is necessary to remove only defective mortar.

This cutting may be done by hand or, when large areas are involved, by power tools. Care should be taken not to damage the units during the cutting process. When the cutting is completed, all dust and loose material must be re-

(Continued on page 88)



Denver Water Works crew lowering 8" pipe. Five crews of 9 men each laid from 18,000 to 35,000 feet of new pipe per month (according to weather conditions) with the "QUICK-WAYS".



"QUICK-WAY" moves alongside trench backfilling as fast as men can tamp dirt. Note extra wide backfiller attachment which was specially built for this work.



8300 feet of new conduit was built in mountains to extend Denver's water supply. Here, two miles above sea level, a "QUICK-WAY" crane speeds work by moving heavy concrete forms.

"QUICK-WAYS"

Reg. U. S. Pat. Off.

VS.

1,000,000 Feet of Water Mains

Denver Municipal Water Works install nearly 1,000,000 feet of new mains in 6 years. Use 7 "QUICK-WAYS" to handle pipe, digging, backfilling—many other tough jobs. Carl Anderson, City Superintendent, tells the story.

Saves Labor Costs of 51 Men—"Our department has used "QUICK-WAYS" since 1946. During that time we have laid almost one million feet of new mains ranging from 3" to 36". Had we still been using the "A" Frame Derrick, or laying by hand, it would have been an impossibility. Where we formerly employed 60 men to a crew, only 9 are needed now. And with the "QUICK-WAYS", they can lay 5 or 6 times more pipe.

Handles Many Tough Jobs—"We also used the "QUICK-WAYS" for backfilling trenches, loading trucks on cleanup jobs, dragline and clamshell work. When the ground got too spongy for heavy trenching machines, we moved in a "QUICK-WAY" with dragline bucket. Often times, this saved us a day or so delay. On line-leaks, we could pull a "QUICK-WAY" off a job many miles away—rush it to the trouble spot—and dig a hole in 3 minutes that would take a crew of men 5 or 6 hours.

Attachments Interchangeable in Minutes—"Another thing I like about a "QUICK-WAY" is that you can change attachments on the job in no time at all. And, it's a rare thing when one is laid up for more than just minor repairs."

"QUICK-WAY" Quality Construction—Denver is only one among many cities, counties and states using "QUICK-WAY" Truck Shovels to save time and work. "QUICK-WAY" gets to and from the job fast. Is quickly convertible—an attachment for every job with four booms. The Trench Hoe excavates, lowers tanks or pipe and backfills with one attachment. The Crane sets steel, loads or unloads logs, rails, materials, pours concrete, operates as a Magnet, Clamshell, Pile Driver, Hay Fork, Log Grapple, or Skull Cracker. Efficient too, as a Shovel or Scoop. "QUICK-WAY" has modern construction, all steel for strength and lightness, simplicity of design, numerous parts interchangeable, correct balance for truck operation, high capacity to weight ratio.

Tearing up a busy street to repair line leak calls for fast work. After breaking surface concrete with compressors, the "QUICK-WAY" backhoe dug a hole 6' x 4' x 10' in 30 minutes which would have taken 4 men all day.



"QUICK-WAY" TRUCK SHOVEL CO. • Denver, Colorado, U. S. A.

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Please send NEW 28 page, two color FREE book giving complete details on all four "QUICK-WAY" Models.

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Says a Midwestern Scraper Operator
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This Missouri scraper operator has learned that Tuffy Scraper Rope pays off in longer runs . . . and the owner of the company he works for knows that Tuffy pays off in lower costs! Tuffy is *specially made* for use on wheeled scrapers. It's tailored to take:

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Tuffy Scraper Rope is ready to mount on your reel spindles. Just remember the name Tuffy, the diameter and the length. That's all you need to know to order Tuffy!

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MASONRY REPAIR . . .

Continued from page 86

moved by brushing or, preferably, with a water jet. If water is used in cleaning the dust from the points, no additional wetting may be required. The repointing should not follow immediately after the joints are washed. Little, if any, wetting will be necessary when the walls are constructed of low absorption units.

The tuck-pointing mortar should not be denser than the original mortar. The natural tendency to use a rich mortar should be avoided in order to eliminate excessive shrinkage and volume change after hardening. For the same reason, it is recommended that the mortar be pre-hydrated before using. In the absence of information on the density and proportioning of the old mortar, a pre-hydrated mortar, mixed in the proportions (by volume) of one part cement, one part lime putty or hydrated lime, and six parts sand, is recommended. It should be pre-hydrated by mixing, at least 2 hr before using, with only a portion of the required mixing water. At the end of the curing period, the mortar must be re-worked, adding the remaining water. This greatly improves workability, and much of the initial shrinkage is eliminated. The mortar should then be packed tightly in thin layers and finally tooled to a smooth compact, concave surface.



SMALL CRACKS and openings in mortar can be sealed by a two-coat application of cement-sand grout brushed in vigorously.

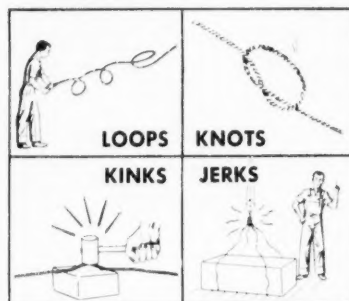
- **Waterproofing Joints**—When the mortar cracks and openings are small, a two-coat application of cement-sand grout, brushed vigorously into the mortar joints, provides an effective and less costly waterproofing method. The typical recommended mixture consists of equal parts, by volume, of portland

(Continued on page 90)

Tuffy



PREVENTS DAMAGE! When These Stresses Happen To Slings



Only Tuffy gives you the 9 part machine-braided wire fabric construction that fights off knots and kinks . . . stands up longer if such stresses occur. These extra Tuffy advantages assure longer sling service that can help you save up to 40% on sling costs!

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Knot it—kink it if you can—put it to the test. See how easily Tuffy straightens out—without damage!

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The Wonder Grease for Concrete Forms

REGARDLESS of whether you use steel or wooden forms for concrete work — you can apply Globe Form Grease by spray, brush, or swab. This time-tested paste emulsion will reduce peeling and pitting to a minimum when forms are removed, and practically eliminate patching.

Due to its special adhering qualities, Globe Form Grease requires only a thin coating for utmost effectiveness. In fact, one gallon adequately covers approximately 200 square feet! And in addition — Globe Form is stainless, leaves a whiter smoother surface, and eliminates the need for painting.

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GREASES**
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**DIESEL
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BUCKEYE LADDER-TYPE DITCHERS

Give you cutting widths of from 8" to 48" with boom lengths up to 16 ft. for all types of utility work. No matter what machine suits your job—Buckeye makes it!



F-5310

GAR WOOD INDUSTRIES, INC.
Findlay Division • Executive Offices • Wayne, Michigan

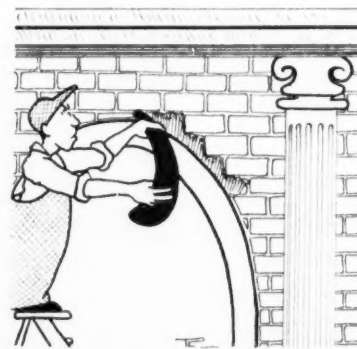
MASONRY REPAIR . . .

Continued from page 88

cement and dry sand passing a No. 30 sieve, with one-fourth part of cement replaced by limestone flour, powdered flint or fine hydrated lime. Joints should be thoroughly wetted before applying the grout, and a templet may be used to help keep the surfaces of the masonry units free of the grout.

When changing the appearance of the wall is not objectionable, a less expensive method of waterproofing consists of a single application of cement grout to the joints, followed with two coats of cement-water paint, applied uniformly over the entire wall surface. Tests at the National Bureau of Standards show cement-water paints to be highly resistant to water penetration and very durable when properly mixed and applied. It should be pointed out, however, that once such a wall is painted, a periodic maintenance cost must be expected.

• **Colorless Waterproofing Materials**, of which there are numerous proprietary mixtures on the market, appear to be of little or no benefit as waterproofing when applied to walls that leak badly, according to the results of tests at the National Bureau of Standards, reported in Building Materials and Structures Report BMS95. Where wall leakage occurs through very fine cracks between the joints and the masonry units, some colorless waterproofers were effective for a period of a year or two but, after

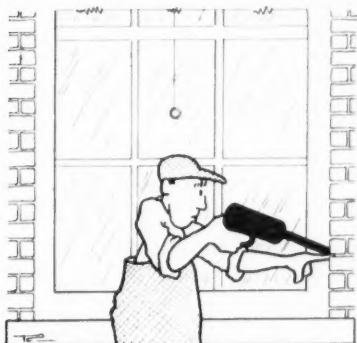


REPLACEMENT of flashing is an expensive maintenance job. But quite often the expense is justified in trouble-free walls.

weathering, their effectiveness as a waterproofer lessened considerably. However, there are colorless waterproofers on the market for which fine performance records are cited. Therefore, it is recommended

that before using such material, its performance on similar jobs in the area be investigated carefully.

• **Flashing**—When the maintenance problem involves the replacement of defective flashing or the installation of flashing which should have been installed when the building was originally constructed, the only proper solution is an expensive repair job—removing the masonry units and placing suitable flashing around and under them. When continuous flashing is required in existing walls at spandrels or other locations, it can be placed by removing alternate masonry sections in widths up to 2 or 3 ft. After the flashing is placed and the masonry properly aged, the intermediate sections can then be removed and the flashing completed. As mentioned before, this is a time-consuming and expensive procedure, but quite often the expense is justified if the work is properly done in order to assure a sound and maintenance-free structure in the future.



PRESSURE-GUN calking of cracks around doors and windows with a good elastic compound takes care of many leaking joints.

• **Calking**—Improper calking often is responsible for the most serious water leakage around door and window frames, and quite often becomes a considerable maintenance expense. If the calking was completely omitted, this can be corrected easily by filling all cracks with good elastic calking compound placed with a pressure gun. On the other hand, if the original calking has cracked, peeled, or separated, it should be completely removed and replaced with new compound. Unless proper pressure is used, only a thin film of calking compound will be placed. Even with good material this will soon become ineffective. Thin films of calking should be removed and properly replaced before serious damage is caused.



GAR WOOD Buckeye

MATERIAL SPREADERS

FINEGRADERS and HI-WAY WIDENERS

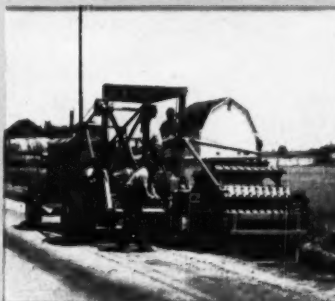
Buckeye Surface Material Spreaders are available in models to give 9', 10' and 12' widths of spread. Materials are spread exactly where wanted—to controlled depths with clean cut edges. No excess material to be raked up later by hand! . . . Flow can be regulated for either uniform or tapered spread—from a mere sprinkle up to 2½" depth. . . . Width of spread can be narrowed in 6" multiples.

BUCKEYE POWER FINEGRADERS

Cut the grade right to specs ready for paving! Two sizes in widths adjustable up to 25 ft. One man operation.



BUCKEYE HI-WAY WIDENERS



Dig flat bottom, clean ditches up to 48" wide and 18" deep, ready to receive material. Does not delay traffic on roads. Digs up to 1 mile per day . . . One man operation.

GAR WOOD INDUSTRIES, INC.

Findlay Division • Executive Offices • Wayne, Michigan



F-5311



AFTER THE JOB was completed by five passes of a Domor elevating grader, this county road ditch shows a uniform "V" cut. All

spoil is loaded and hauled away, as ditching proceeds. Loose dirt remaining is washed down by rains.

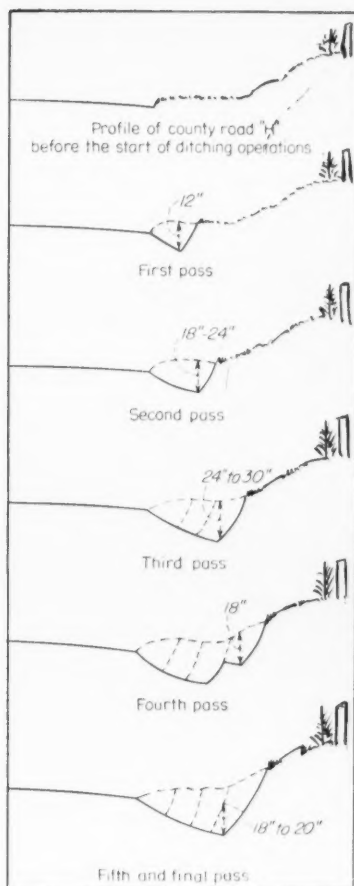
Precise Sloping Ditch Replaces . . .



BEFORE THE JOB of ditching began, accumulations of silt and weeds had raised the roadside above the level of the gravel-topped

secondary road and choked off efficient drainage. Windrowing of material on road surface is not permitted.

. . . Weed-Choked and Silted Roadside



FIVE-STEP SEQUENCE shows how one machine does it all. With this method, the supply of trucks is the deciding factor in production.

MANY MILES of ditches along secondary roads in Poweshiek County, Iowa, are being re-established by using two Domor elevating graders and Caterpillar No. 12 motor graders.

Last summer, the county supervisors, along with the county highway foreman, decided that some means had to be found to clean ditches without windrowing material. There is no rock or gravel within the county, and any surface material on the roads must be treated with care. Rock or gravel hauled in from outside the county is too expensive to pick up with the ditch clean-out material.

Prior to this time, Poweshiek County had cut ditches to the fence line wherever possible, but this method was far from satisfactory.

Ditches are cut in from three to five passes. The first cut is 8 to 12 in. and establishes the ditch line. The second cut is about 20 in. deep; the third about 30 in. The fourth cut is 20 in. but only half way to



FIRST PASS by Domor-equippped Caterpillar grader cuts a "V" notch about 12 in. deep, establishes the ditch line. Dodge and Chevrolet trucks haul the material.



THIRD PASS slices farther into the roadside bank and cuts down 24 to 30 in.—maintaining a uniform, wide slope. Average production is 1/2 mi of finished 40-in. ditch per day.



FOURTH PASS brings ditch to full width, one more pass cuts toe to full depth. Both sides of road are ditched as necessary. Ditches do not have to be bladed.

the final toe of the ditch—the fifth cut is in the same path as the fourth but is all the way to the toe of the ditch, usually 20 to 25 in. Finished ditches average about 40 in. deep.

The average production is a half-mile of finished ditch a day. The finished ditches do not have to be bladed.

Trucks are loaded in from 40 to 55 sec. Trucks are the deciding factor in production. Regardless of the haul, one truck is used for short

haul only in order to keep production fairly constant. Poweshiek County officials feel that the Domor elevating grader, by doing the ditch cutting, conveying and loading, all in one simple operation, has proved to be the answer to continuous ditch maintenance on their three highway districts.

In addition, the Domors operate for Poweshiek County as a road construction team for part of the year. They cast up material for fill,

THE INSIDE STORY OF CONTROLLED IMPACT ACTION

HERE'S WHY

THE PMCO IMPACT MASTER

gives you top capacity . . . lower costs . . . greater control of finished product size



Patent Pending

Adjustable feed plate (1) guides in-coming rock at proper angle into first rotor hammer circle (2). In-fed rock is intercepted in motion, exploded instantly by the terrific impact of the rotor hammers and simultaneously projected toward deflector screen grate (3) where finished sizes are immediately discharged.

Oversize particles are deflected upwards, intercepted by feed chute back plate (4) and guided downward into the path of the second rotor hammer circle (5) where they are exploded and projected toward the bottom half of the deflector screen grate and the lower screen grate (7) for immediate discharge.

Both rotor hammers rotate in the same direction toward the rear, promoting fast feeding and keeping all material flowing toward the discharge for top capacity.

Finished product sizes are controlled by the speed of the rotor hammers, and by simple adjustments (8) of stripper bar (6) and lower screen grate.

By controlling the in-fed rock and directing its flow, the breaking is accomplished by the impact of rotor hammers upon the rock. This reduces wear and makes possible the more uniform gradation cubical aggregate.

GET THE FULL PROFIT-MAKING STORY

Write for literature. Get complete details on the PMCO Impact Master. Learn all about its high ratio of reduction which eliminates secondary crushers and auxiliary equipment. Get top quality uniform gradation cubical aggregate and greater production of saleable finished sizes. Impact Masters are used in open and closed circuits for producing road-building and concrete aggregates, and can be adjusted for the simultaneous production of aglime when desired. They are available with capacities to 750 tons per hour. Write today.

PMCO Impact Master Division, Universal Engineering Corporation, 625 C Avenue N.W., Cedar Rapids, Iowa



UNIVERSAL ENGINEERING CORPORATION Subsidiary of **PETTIBONE MULLIKEN CORPORATION**

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Your CAT- INTERNATIONAL or AC deserves the best!

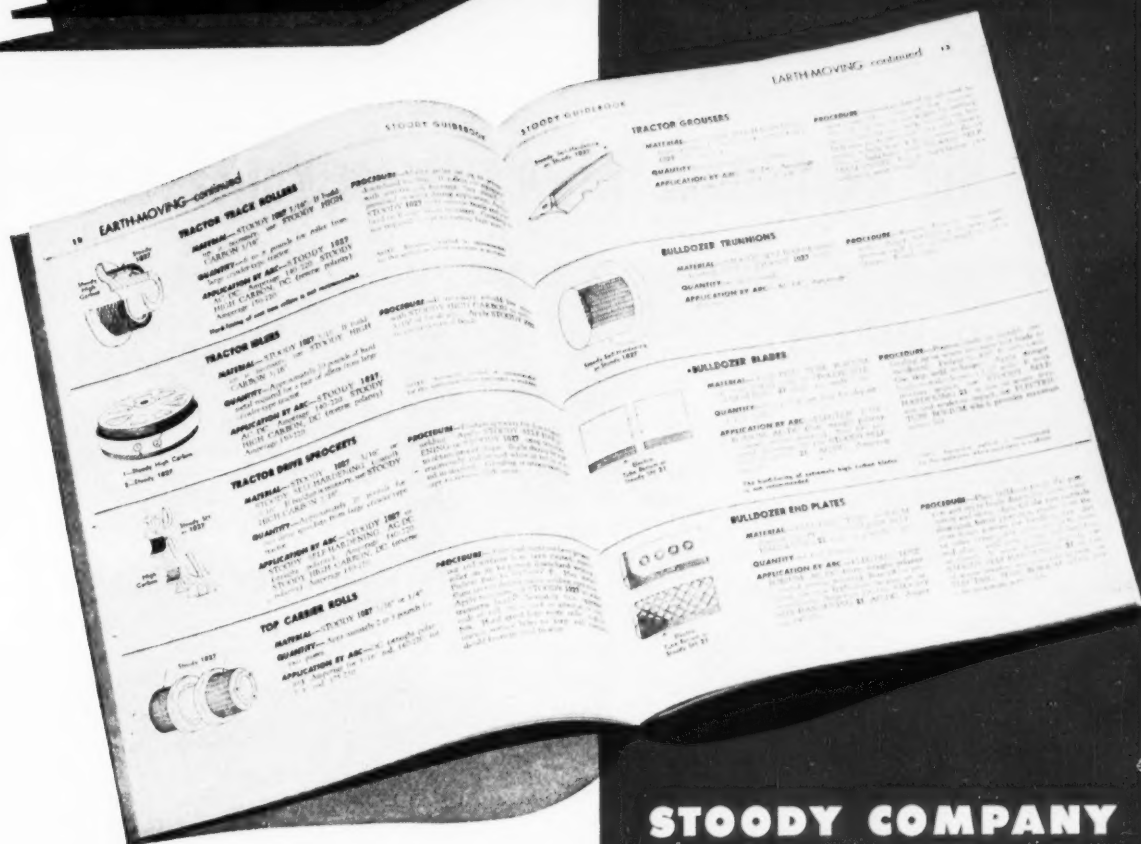
Protect it with

**Stoody
Hard-Facing!**

Good as they are, these famous crawlers do need occasional rebuilding to keep them on the job.

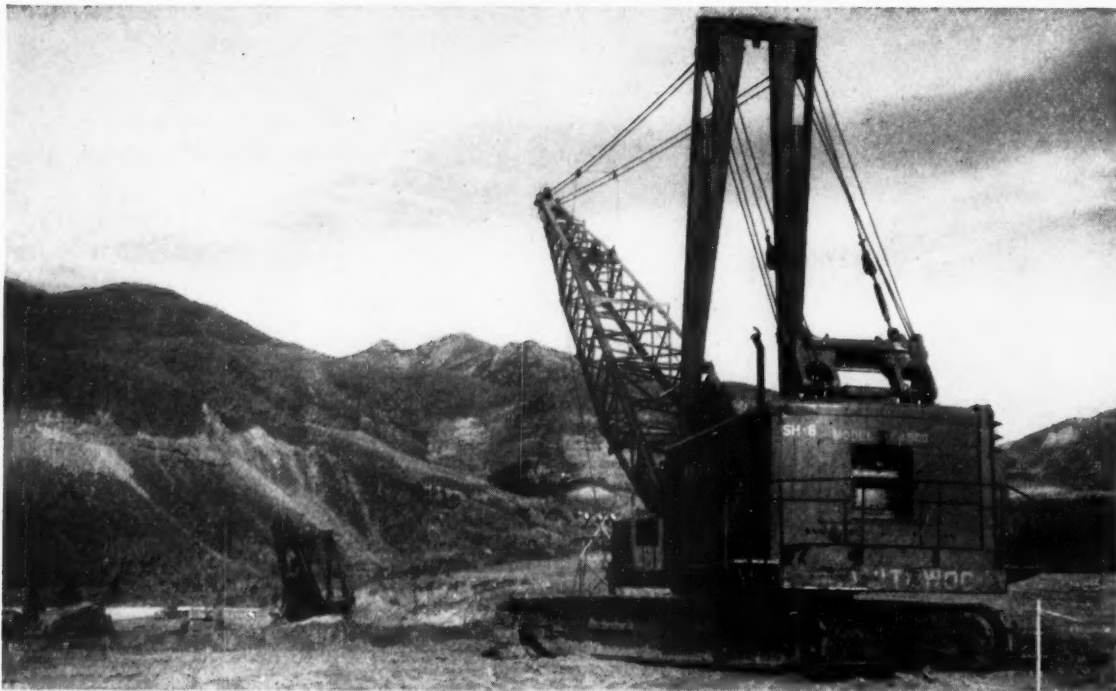
While your tractors are down for maintenance, give them the best! Stoody Hard-Facing Alloys repay by making every worn part deliver additional hours of useful service, saving you money.

The newly revised Stoody GUIDE-BOOK illustrated here gives tried-and-proven facts on tractor maintenance... names the best Stoody Alloy for each worn part... The exact procedure for hard-facing. The book is yours at no charge—just write for your copy!



STOODY COMPANY

11972 EAST SLOAN AVENUE, WHITTIER, CALIF.



BIG BRUTES move into the borrow pit at Palisades Dam to get filling of the 14-million yard embankment under way. These are a Manitowoc 4500 dragline and shovel, Caterpillar diesel powered, each gulping 5 yd per bite. (C)

Big Equipment Moves in on Palisades Dam,

IT TAKES A WHOLE SEASON just to get started in building a modern big dam, and that was the case last summer and fall as Palisades Contractors and a flock of subcontractors moved in to begin construction of Palisades Dam on the South Fork of the Snake River in southwestern Idaho near the Wyoming border. When the job opens up again this spring, the

contractors are all set to make the dirt fly.

Palisades Dam will be the largest earth and rock fill structure ever built by the U. S. Bureau of Reclamation. The main embankment will require close to 14,000,000 cu yd of fill, crest length will be 2,200 ft; height, 273 ft; width toe to toe, 2,250 ft. The reservoir will impound 1,400,000 acre-ft. The

powerhouse will have a capacity of 114,000 kw.

More than 2¾ million yd will come out of foundation excavation and dam preparation. Two 30-ft dia tunnels are now being driven, 1,224 ft and 1,677 ft long for power and outlet works, respectively. They will be used for diversion during dam construction. Also included is 3½ mi relocation of U.S.



GOOD HAUL ROADS are the key to efficient earthmoving on a big dam, and here the contractors are paying particular care to drainage by installing AD-40 grader. (A)



RELOCATING US ROUTE 26 is a major operation in itself. Here Kiely Construction Co. slices down a big sidehill cut with the aid of Cat-powered Gardner-Denver compressors and wagon drills. (C)



PIONEERING in rough country to relocate 18 mi of forest roads, Dillsworth & Pumnea tackle a rocky hillside with an Allis-Chalmers HD-20 equipped with a Gar Wood angle dozer. (A)



ALL THIS ROUGH GOING just to get an access road to diversion tunnel portals. Baker bulldozer on an A-C HD-20 cleans blasted rock out of sidehill; wagon drill prepares for more shooting. (A)

Reclamation Bureau's Biggest Earth Fill

Highway 26 and 18 mi of forest roads. A previous contract for 2½ mi of Route 26 relocation is nearing completion. The powerhouse will have a capacity of 114,000 kw.

Louis B. Ackerman is resident engineer in charge for the Bureau of Reclamation, assisted by Pat O'Donnell.

Palisades Contractors, who hold
(Continued on page 99)

(A) Allis-Chalmers photo—(C) Caterpillar Tractor photo



UNLIMITED SAND AND GRAVEL supply for concrete aggregates lies in the river valley. Here husky Caterpillar DW-21 tractor and scraper rigs dig a load unassisted for haul to aggregate plant. (C)



KIELY BOTTOMS OUT another big hillside cut on Route 26 relocation with a Caterpillar No. 12 motor grader and DB bulldozer. Isn't that a beautiful slope? (C)

GENERALS

do any job, anywhere —
**FASTER! EASIER!
AT LOWER COST!**



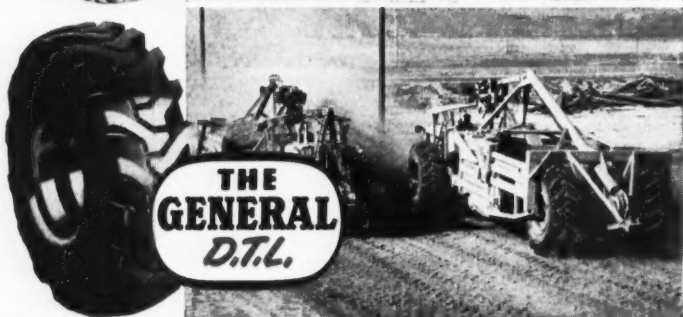
GENERAL L. C. M.

For most work off the road, some on. Broad, deep lugs and thick, rugged shoulders prevent cuts, snags, bruises. More rayon cords, more rubber for extra carcass strength.



GENERAL H. C. T.

Designed for most work on the road, some off. Long-wearing safety tread and reinforced shoulder cleats give more traction, more original and recap miles.



GENERAL DUAL TRACTION LUG

To move more yards of dirt, the General Dual Traction Lug digs deep for more traction in soft going, forward or backward. Makes heavy jobs easy.

Make Every Worn Tire Work Longer for More Profit!

**Your General Tire Dealer will KRAFT SYSTEM RECAP Worn Tires
with the New General Truck Tire Tread of Your Choice**



You're throwing away money when you throw away worn tires or accept an ordinary "adjustment" for them. Let your General Tire Dealer—a tire expert—restore worn tires with famous factory controlled Kraft System

Recapping. You choose from the complete line of on and off-the-road new General Tire treads and he'll put that tread on your worn tire. He can do sectional repairs too. Get Kraft System Recapping—get more profit from every tire.

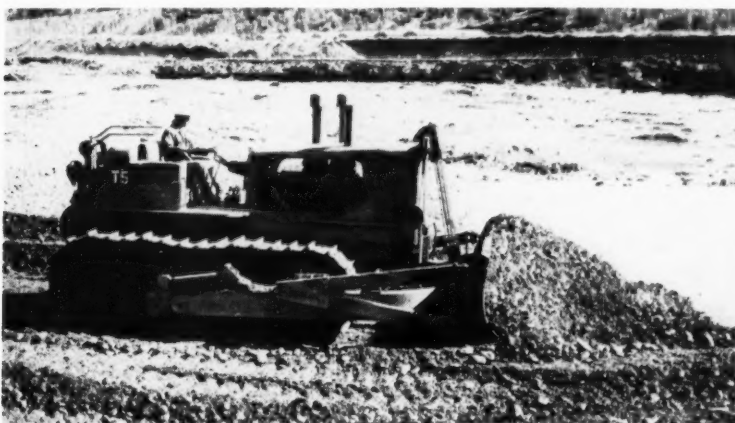
SPECIFY GENERAL TIRES ON YOUR NEW EQUIPMENT



POCKETS IN DAM FOUNDATION must be backfilled with selected material. Euclid end-dumps deliver the material, but it is tugged into place in deep holes by an A-C HD-5 bulldozer that scampers up and down the steep banks like a bug. (A)



LEVELING UP the base of main embankment, this A-C AD-40 motor grader puts in two 10-hr shifts per day. HD-20 tractors pull sheep-foot rollers over the lifts for compaction. And here's another view of the highway relocation. (A)



GRADING THE SWITCH YARD area is just one of many miscellaneous jobs connected with building a big dam. Here an A-C HD-20 tractor and Gar Wood bulldozer lift the area out of the mud. (A)

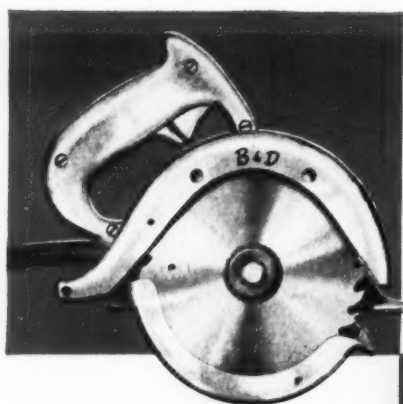
the primary contract for \$29,000,000, is a combination of J. A. Jones Construction Co., Charlotte, N. C. and Seattle, Wash., and Charles H. Tompkins Co., Washington, D. C. Harold T. Newton is district manager. A. L. Pauls (who recently completed Buggs Island Dam) is project manager, and William J. Kennish is general superintendent.

Principal subcontractors on the project include:

J. A. Terteling & Sons, Inc., Boise, Idaho, power and outlet tunnels.

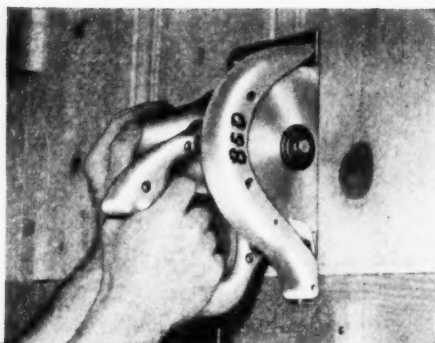
Boyles Bros. Drilling Co., Salt Lake City, Utah, drilling and grouting.

Kiely Construction Co., Butte, Mont., $3\frac{1}{2}$ mi relocation of U. S. (Continued on page 102)



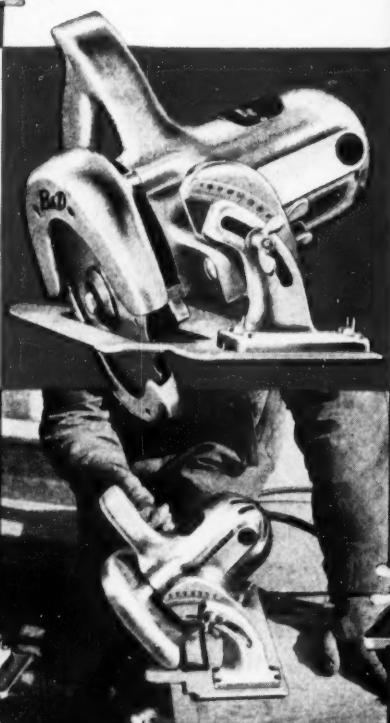
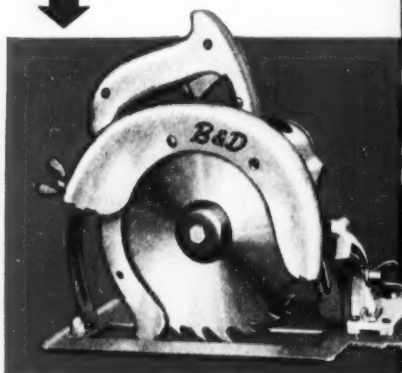
B&D UTILITY 6" HEAVY-DUTY SAW ... \$56.50

Weighs only 9½ lbs. Cuts to 2½". Also available with depth and bevel attachment. Custom powered by B&D.



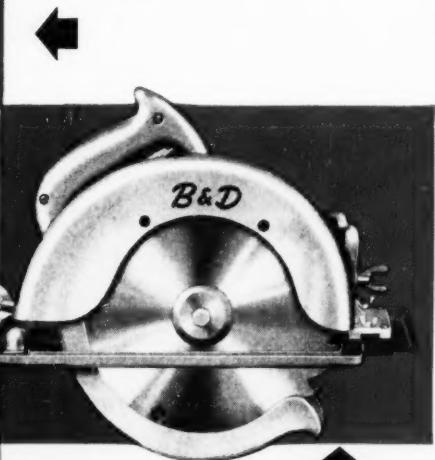
B&D UTILITY 7" HEAVY-DUTY SAW ... \$88.50

Weighs only 10¾ lbs. Cuts to 2⅞" at 0°, cuts 2" dressed lumber at 45° with built-in depth and bevel adjustment. Custom powered by B&D.



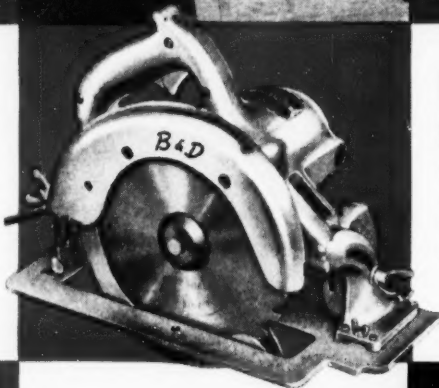
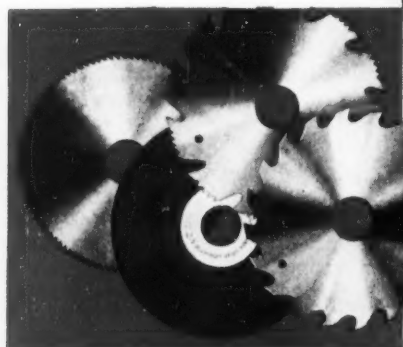
B&D UTILITY 6" HEAVY-DUTY DELUXE SAW ... \$76.50

Weighs only 10½ lbs. Cuts to 2" at 0°, to 1⅞" at 45° with built-in depth and bevel adjustment. Custom powered by B&D.



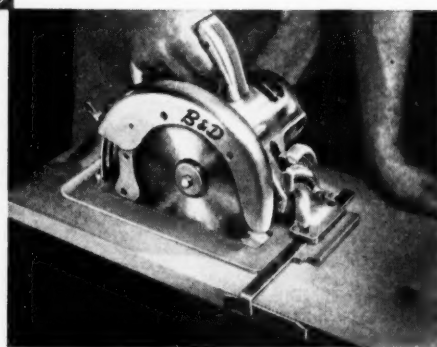
B&D UTILITY 8" HEAVY-DUTY SAW ... \$92.50

Weighs only 14¼ lbs. Cuts to 2⅜" at 0°; to 2⅞" at 45° with built-in depth and bevel adjustment. Custom powered by B&D.



B&D UTILITY 9" HEAVY-DUTY SAW ... \$117.00

Weighs only 15¾ lbs. Cuts to 3¼" at 0°; to 2⅞" at 45° with built-in depth and bevel adjustment. Custom powered by B&D.



There's a B&D UTILITY Blade for every purpose!

Blades for general and special purposes, including Carbide-Tipped, Planer and Flooring blades and Abrasive Discs.

Now you can get...

CUSTOM-POWER in a complete line of B&D UTILITY SAWS!

There's a Black & Decker UTILITY SAW for every job to speed schedules, save time, slash costs!

WHATEVER your sawing job, you'll find the Saw exactly suited to your needs in the *complete* Black & Decker Utility Heavy-Duty Saw Line! You have *five* models to choose from . . . in blade diameters from 6" to 9", cutting capacities up to 3¼" depth . . . plus the versatile, new Portable Jig Saw . . . for everything from roughing out to final trim. They'll save you time, money and man-hours whether you're sawing studs, roof trusses, rafters, joists or stair stringers; building cabinets or trimming stock size millwork to fit; cutting slate, tile, galvanized sheet or composition materials!

What's more, every B&D Utility Saw features CUSTOM-POWER that beats hand sawing 10-to-1! Special universal motors are designed and built right in our own plant specifically for tough power sawing. Each one is CUSTOM-MADE for the Saw it drives . . . with a reserve capacity to take the rough spots without overheating or slowing down!

And that's not all!

Other features include light weight, perfect balance, telescoping blade guard, instant-release triggerswitch, grease-sealed ball bearings and top-quality helical gearing.

For a free demonstration see your favorite B&D Utility hardware or building supply dealer. Or write today for free Saw catalog to: THE BLACK & DECKER MFG. Co., 630 Pennsylvania Ave., Towson 4, Md.

Use these other Black & Decker Tools to speed jobs and save Time and Money



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PORTABLE ELECTRIC TOOLS

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DRILLS . . . Models and speeds to fit any job. In capacities from ¼" to 1½" in steel, double in hardwood.



HAMMERS . . . Drive star drills, nail points, chisels in masonry, other materials. Four models, ½" to 2" hole-capacity in concrete.

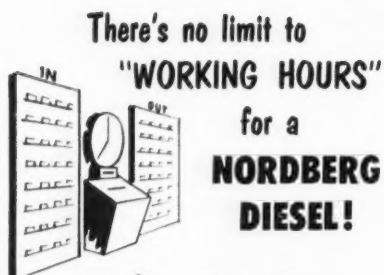


VALVE REFACERS . . . Grind factory-accurate angle on valve faces. Grind valve stems, tappets & rocker arms for exact clearance.

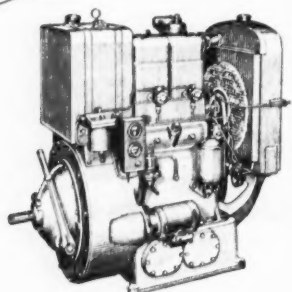


VALVE SEAT GRINDERS . . . Famous Vibro-Cutler® action puts a mirror finish on internal combustion engine valve seats in seconds.

Write for FREE catalog of other B&D construction tools to: THE BLACK & DECKER Mfg. Co., 630 Pennsylvania Ave., Towson 4, Md.



There's no limit to
"WORKING HOURS"
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**NORDBERG
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**... they're built better
to last longer**

No "9 to 5" routine for Nordberg "4FS" series Diesel engines . . . they're built to stay on the job around the clock—day in and day out. Using sturdy, heavy duty construction throughout, these conservatively rated units are your best buy for the toughest kind of power jobs . . . in construction, oil field, irrigation, power plants, marine service and scores of other power requirements.

Built in 1, 2 and 3-cylinder models, these reliable, low cost Nordberg Diesels are available as power units in sizes from 10 to 45 hp; as generator sets from 6 to 30 kw; and as pumping units in capacities from 200 to 3,000 gpm at 15 to 240 ft. total head.

And remember—Nordberg Diesels are backed by over 60 years' experience in the design and construction of heavy duty machinery for the world's industries. Clip the coupon for full details.

NORDBERG MFG. CO., Milwaukee, Wis.



MAIL THIS COUPON TODAY.

Nordberg Mfg. Co., Milwaukee, Wisconsin
Send catalog covering Nordberg Type 4FS Diesels. I am interested in a unit for the following service:

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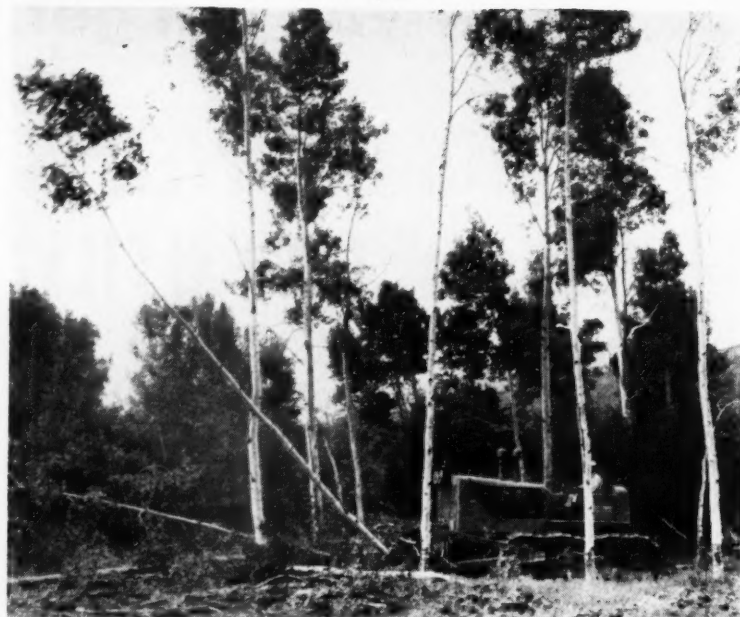
Company Name _____

Address _____

City _____ Zone _____ State _____

4-153

PALISADES DAM . . . Continued from page 99



CLEARING reservoir and dam sites isn't too heavy, but all that brush makes it messy. This Allis-Chalmers HD-20 tractor and Gar Wood bulldozer swamps out 5 acres every 8 hr. (A)



STRIPPING BORROW PITS is another big job, but this Cat DW-21 outfit takes it in stride. Across the Snake River is one borrow pit ready for excavation, and high on yonder hill is a relocated section of U. S. Route 26. (C)

Highway 26. (Jack Olson, Rigby, Idaho, is finishing up previous contract for 2½ mi relocation Route 26).

Dillsworth & Pumnea, Helena, Mont., 18 mi relocation forest roads. Union Construction Co., Noxon, Mont., clearing on highway relocations and borrow pits.

Lee Union Construction Co., Missoula, Mont., clearing.

San Jose Steel Co., San Jose, Calif., reinforcing and structural steel and chain link fence around spillway.

Rush Construction Co., Amboy, Wash., aggregate for powerhouse and tunnels.

J. H. Wise & Son, Inc., Boise, Idaho, camp construction.

Brennan Construction Co., Pocatello, Idaho, and Rickenbach & Hokanson Co., Bedford, Wyoming, miscellaneous.

The accompanying pictures tell the story of preliminary operations. Our sincere thanks to Allis-Chalmers Manufacturing Co. and Caterpillar Tractor Co. for assisting with pictures and information.



DIGGING INTO a borrow pit is a P&H 2½-yd shovel loading Euclid end-dumps for haul to the fill, while an A-C HD-20 with Baker bulldozer keeps the bottom trimmed up. (A)

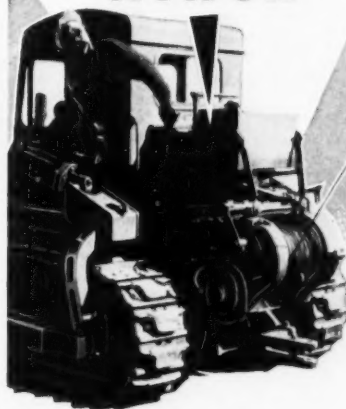


GOOD HAUL ROADS for the Euclid trucks moving dirt from pits to fill are maintained by A-C AD-40 motor graders. Sprinkler trucks also keep the roads in top condition. There's that highway relocation job again in the background. (A)

→
SPREADING ROCK in the rockfill section of the dam is a mean job, but the man says this A-C HD-20 and Baker bulldozer outfits move 3,200 cu yd every 10-hr shift—and that's a good day's work. (A)

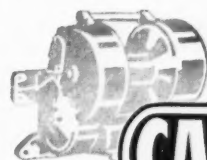


USE A CARCO WINCH



FOR AN "ON-THE-GROUND" INSURANCE POLICY

FOR an "on-the-ground" insurance policy equip your tractors with Carco winches. Carco winches reduce "down time" by converting your tractors into mobile general utility tools . . . by doubling tractor pulling power and increasing tractor "reach." They are instantly available for towing heavy machinery, rescuing mired or ditched equipment, pulling pipe, stumps, rocks, buildings and riggings, setting poles, clearing and cleaning up as well as a multitude of other uses that help keep your jobs moving ahead on schedule. See your nearest Carco dealer for more complete information. PACIFIC CAR AND FOUNDRY COMPANY, Renton, Washington. Branches at Portland, Oregon, and Franklin Park, Illinois.



WINCHES
For All Industrial
Tractors

CARCO



- loads trucks
- hugs curbs
- dodges poles
- makes vertical set-ins
- undercuts sidewalks

COMBINING big work capacity with extreme flexibility, Parsons heavy-duty 250 Trenchliner digs 16" to 42" wide, up to 12½ feet deep. 30 digging feeds from 3.8" to 9¾ feet per minute assure maximum trench production at every depth, width, in all kinds of soils. Buckets and side-cutters are equipped with easy-in, easy-out "Tap-In" teeth. With full reverse of all operations, sloping ladder boom makes vertical set-ins, flush with foundations, against building walls . . . or undercuts sidewalks, sewers and old mains.

Flexibility is further increased because shiftable boom cuts within 11" of side obstructions . . . digs as efficiently behind either crawler as it does in

center position. Spoil conveyor shifts completely through machine by power in less than 1 min. to dodge poles and buildings without swerving from grade line . . . belt direction is instantly reversible to dump right or left. Arc of conveyor gives low-level, close-to-trench deposit . . . or reaches up to 6'-8" (8'-8" with extension section) for loading into trucks. Discharge height remains constant, regardless of digging boom position.

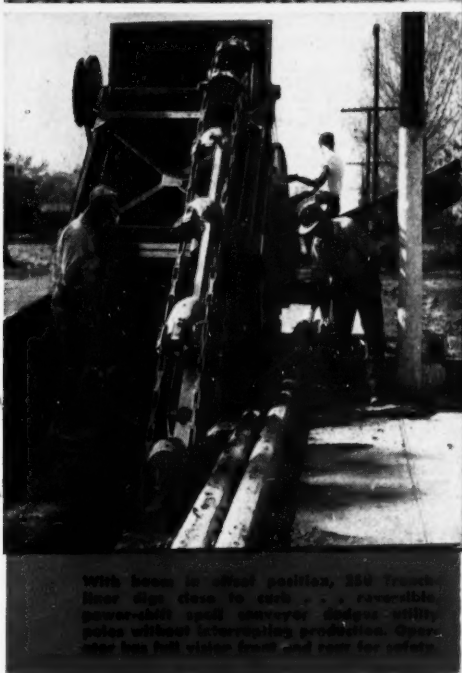
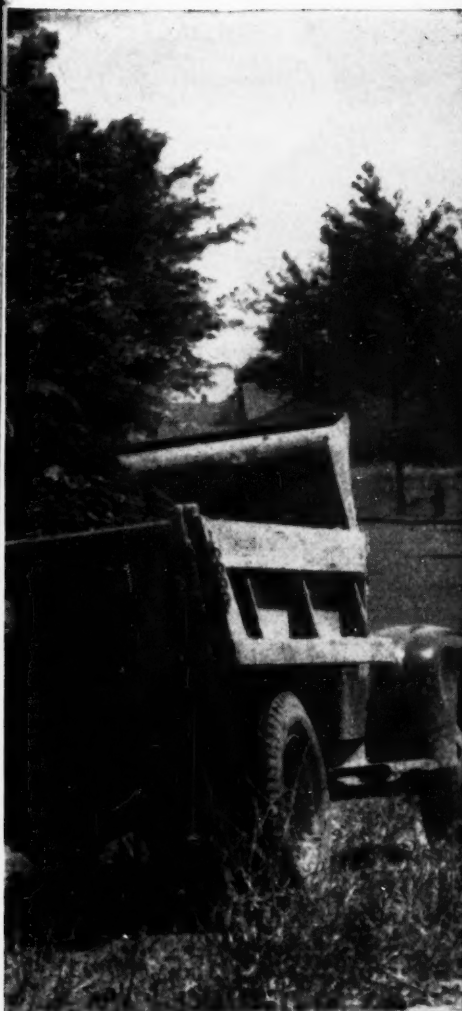
To check on the 250 Trenchliner's many heavy-duty mechanical features, contact your Parsons distributor, or write for bulletin. Other sizes: 2 ladder-types, 2 wheel-types, full crawler mounted . . . and rubber-tired Trenchmobile®.



PARSONS Trenchliners

PARSONS COMPANY, NEWTON, IOWA (Foster Wheeler Subsidiary)

CP107-BEE

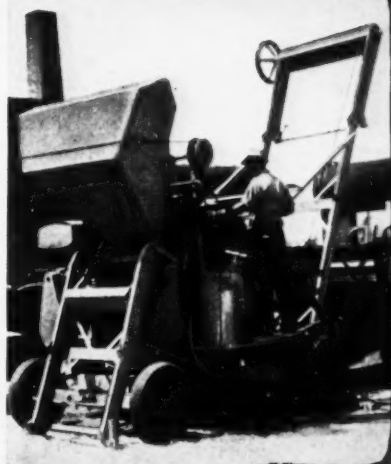


With boom in vertical position, 304 Trench Hoe dig down to 19 3/4 ft. - a coverable power-shift and crawler design with no need for intermediate production. Operator has full vision front and rear for safety.

10, 14-CU. FT. Kwik-Mix Bituminous Mixers

With Kwik-Mix non-tilting 10 and 14 cu. ft. Bituminous Mixers you get: wide flow-line skip, hinged skip track, pug-mill-type mixing, accurate heat control, even bitumen distribution, 6-second end discharge. Both sizes can be used with Tower Loader (shown) for stockpiling or loading trucks. Also available on skids as stationary plants. Other units: concrete; tilt, non-tilt plaster-mortar mixers; and Moto-Bug® (power wheelbarrow).

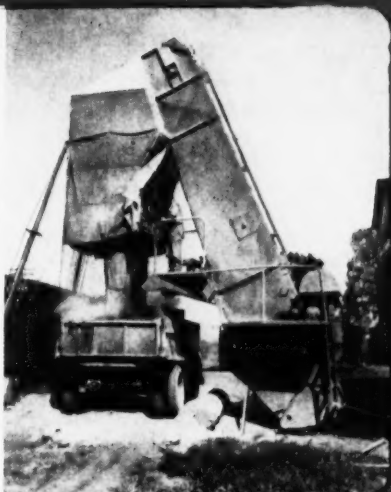
KWIK-MIX (Koehring Subsidiary)
Port Washington, Wis.



DUAL-PURPOSE Johnson Elevating Charger

As batch plant, Johnson Elevating Charger has a size 14 1000-lb. cement weigh batcher, hung under a 33-bbl. overhead storage hopper . . . or, to charge dual-batch trucks, two 1000-lb. weigh batchers can be used. It's quickly changed to transfer plant by removing batchers and cone, and bolting a 50-bbl. extension section to upper hopper. Easily moved and erected by dump truck, no crane needed. See your Johnson distributor.

C. S. JOHNSON (Koehring Subsidiary)
Champaign, Ill.



DIG 19 3/4 FT. DEEP with Koehring 304 Hoe

As a heavy-duty hoe, Koehring 3/4-yd. 304 digs 19 3/4 ft. below crawlers. Dipper arm, pivoted at end of boom, jack-knives to dig vertical back-wall . . . close-coupled dipper pulls up tight to boom. Hoe readily converts to shovel, dragline, clamshell, or to 13.9-ton lift crane on crawlers (25 tons on truck or cruiser mounting). Other Koehring heavy-duty sizes: 1/2 to 2 1/2 yds. dipper capacities . . . and 7 3/4 to 79 1/2 tons lift capacities.

KOEHRING COMPANY
Milwaukee 16, Wis.



X61



Smooth Starts mean low operating costs

WHEN a rear-dump truck pulls away smoothly from a shovel with a 30-ton pay load—without jolts and jerks—it's sure to stay on the job longer with less down time.

Trucks equipped with Allison TORQMATIC converters and transmissions always start smoothly—because TORQMATIC DRIVES absorb these shocks instead of transmitting them to other truck parts.

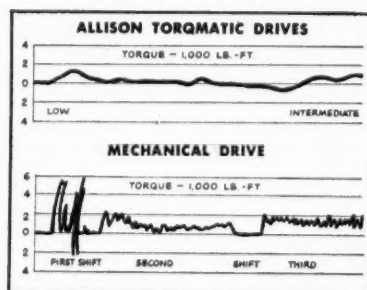
To demonstrate this, Allison engineers measured power-train shock loads in a large number of earth-moving, coal and ore-hauling trucks under both normal and extreme operating conditions. These charts show the results.

Trucks equipped with Allison TORQMATIC DRIVES showed starting shock loads four times less severe than trucks using mechanical drives. Furthermore, trucks equipped with Allison TORQMATIC DRIVES were *quick-shifted* at full throttle.

If you're operating off-highway trucks or other heavy-duty earth-moving equipment, specify Allison TORQMATIC DRIVES, the matched team of torque converter and hydraulic transmission. Ask your dealer, equipment or engine manufacturer for further information or write to:

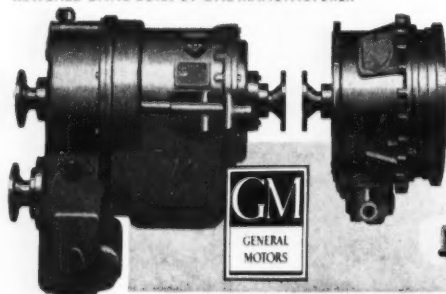
ALLISON Division of GENERAL MOTORS
Box 894TT, Indianapolis 6, Indiana

POWER-TRAIN SHOCK LOADS



Note the jagged line—shock loads—as the mechanical drive truck pulls away from the shovel and shifts from first to second gear. Compare the smooth line—no harmful shock loads—for the truck equipped with Allison TORQMATIC DRIVES.

MATCHED UNITS BUILT BY ONE MANUFACTURER



Allison TORQMATIC DRIVES



COMPACT, EFFICIENT HYDRAULIC DRIVE FOR TRUCKS * CRANES * TRACTORS * SHOVELS * DRILLING RIGS * SCRAPERS

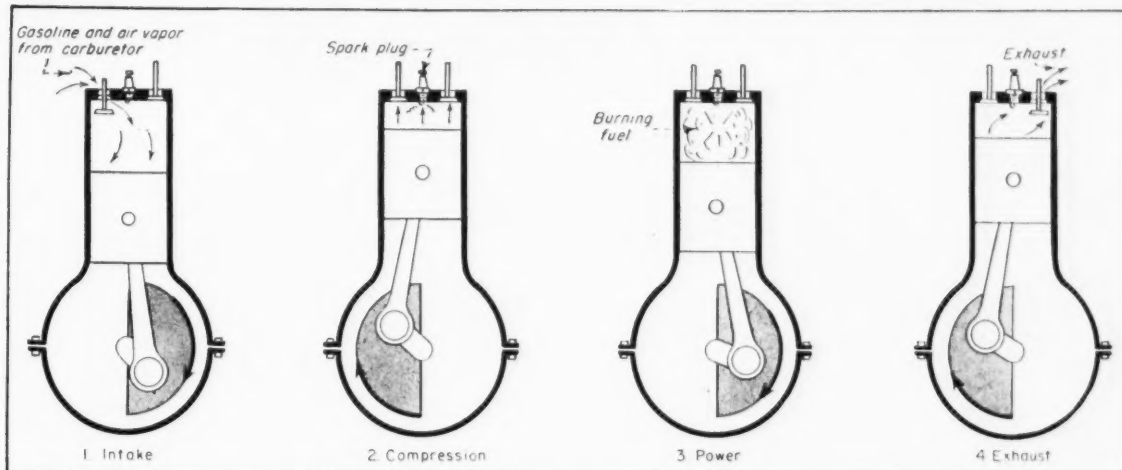


Fig. 1 ...

FOUR-STROKE CYCLE GASOLINE ENGINE operation is well-known to most everyone in construction, but an occasional review of the spark-ignition engine is helpful. This is especially true when comparing gasoline and diesel engine cylinder designs.

How Four-Cycle and Two-Cycle Diesels Work

By J. W. BROWN Detroit Diesel Engine Div., General Motors Corp.

TO UNDERSTAND ENGINES, it is first necessary to understand what takes place in an engine—how fuel is converted into work. This requires some explanation of the combustion cycle which usually is considered in four parts or "phases."

The four phases of the combustion cycle of an internal combustion engine are: Intake, Compression, Power and Exhaust. Whether the fuel used is gas, gasoline vapor or fuel oil, the four phases of combustion are the same. For illustration

we have chosen the two most common types of internal combustion engines—the gasoline and the diesel engine.

Both the gasoline and the diesel engines are built in two forms, the four-stroke cycle and the two-stroke cycle, commonly known as four-cycle and two-cycle engines. The difference between them lies in the number of up-and-down strokes of the piston within the cylinders required to bring about and to make use of the four phases of the combustion cycle.

The most common gasoline engine is the four-stroke cycle engine, such as is used in automobiles. A great many two-stroke cycle gasoline engines are used, however, in outboard motors, motor-cycles, lawn mowers, chain saws and similar applications.

Gasoline engines and diesel engines have many parts in common. They both use pistons which move up and down within the cylinders and which are attached to a crankshaft from which power is taken.

(Continued on page 110)

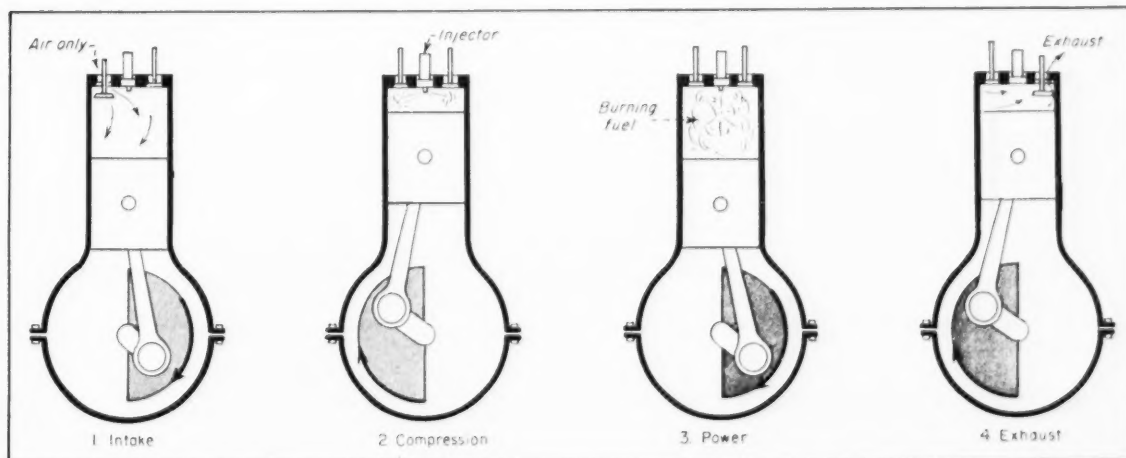


Fig. 2 ...

FOUR-STROKE CYCLE DIESELS also have intake and exhaust valves, but ignition of the mixture is brought about by the high temperature created when the rising piston compresses the charge of air. Fuel is injected at precisely the right moment.

THE RIGHT POWER... PROPERLY APPLIED

**MEANS
FASTER, LOWER-COST
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DESIGNED FOR FASTER LOADING

Job time studies prove that Heiliners do a faster, better job of loading than any other units of the same size. It's the skillful, balanced design that does the trick. The bowl is designed to "boil" up a fountain of dirt in the center of the bowl, quickly heaping both back and front with evenly balanced pay load. The bowl and the cutting edge do most of the work to save horsepower. With Heil's planetary drive, the final reduction is in the drive wheels, where it does the most good. There's less torque in the axle and no "chatter" on the drive wheels. It provides a smooth application of power from engine to tire for the ultimate utilization of available horsepower. Heiliner's extra large rim size is another power-saving design feature. It permits greater ground contact area for better traction and flotation in soft going.

POSITIVE "TILTING FLOOR" EJECTION

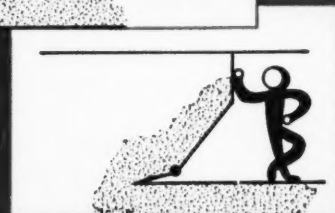
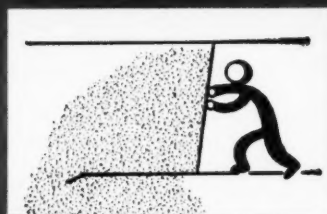
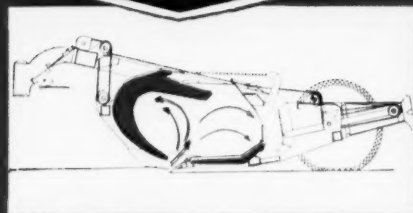
Heiliners have the advantage of the simplest, most efficient type of positive forced ejection known. The diagrams at the right show you why "Tilting Floor" ejection saves horsepower. With the ordinary square bowl, not only pressure against the sides must be overcome, but more horsepower is needed to overcome the tremendous pressure of tons of heavy dirt on the bottom of the bowl. With the Heiliner, the floor simply tilts up to a 75° angle by means of a positive ram action. After the initial static friction is overcome, the only pressure the power control unit has to overcome is that exerted on the sides of the bowl.

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When you buy Heiliners, you don't buy power that's wasted. There's plenty of power in the big Diesel engine to meet every job condition efficiently, with ample reserves to handle the toughest job. Heiliners "right power, properly applied" reduces first cost as well as operating and maintenance costs.

LOWER OPERATING COSTS

Every Heiliner feature is designed to cut operating costs. Lower power requirements reduce fuel consumption. Big pay load capacity lets you move more dirt per trip. High haul speeds mean an extra trip or two an hour for extra profit. "Passenger car" steering with Heil's exclusive, patented Hydro-Steer, plus big, safe 4-wheel brakes assure easier handling and give the operator confidence to utilize the full power of the machine at all times. Low maintenance requirements and easy servicing reduce downtime.



**IT ADDS UP TO
LOWER COST PER YARD
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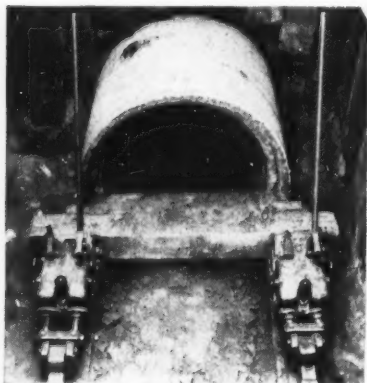
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DIESEL ENGINES . . . Continued from page 107

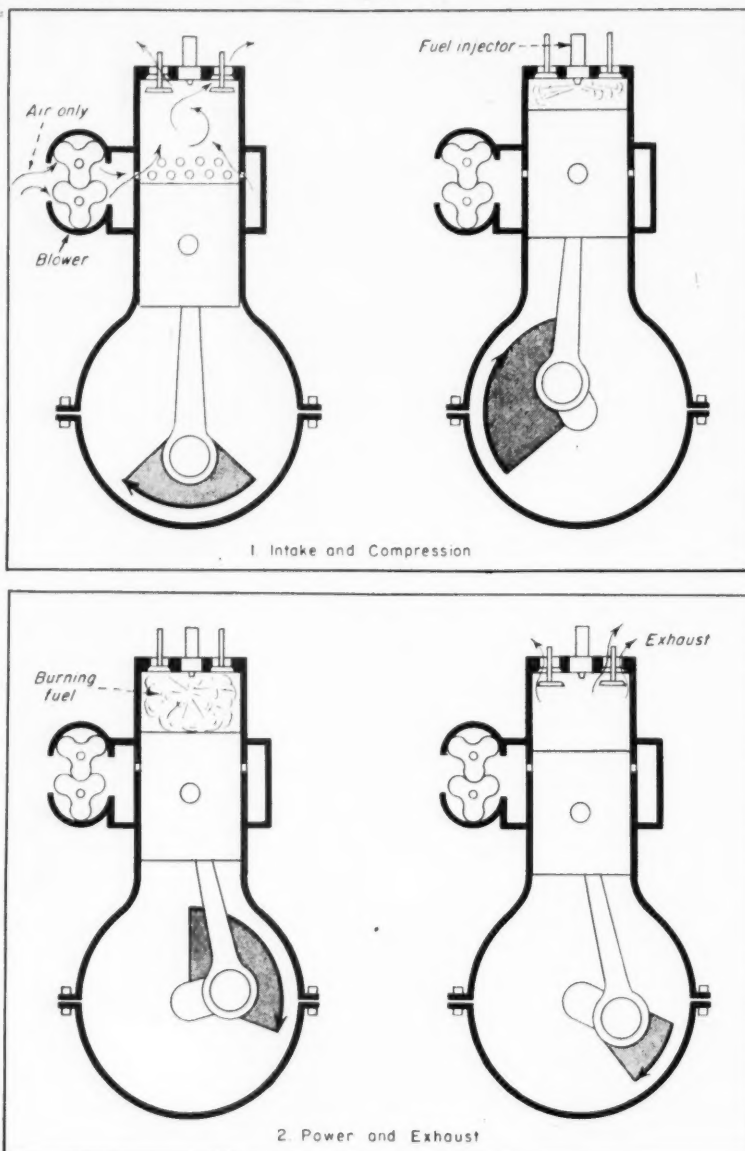


Fig. 3 . . . TYPICAL TWO-STROKE CYCLE DIESEL cylinder delivers power during each revolution of the crankshaft. Atmospheric air is brought in by a blower through side ports when the piston is down, then compressed. Power and exhaust functions occur on the down stroke. Note two exhaust valves.

They both use some type of valve for the intake of gasoline vapor or air and for the outlet of exhaust gases. Both usually use some form of liquid cooling, although some gasoline and diesel engines are cooled by air alone.

The principal difference between the gasoline engine and the diesel engine is the means by which fuel is burned to bring about the third phase of the combustion cycle, Power Liberation. In the case of the gasoline engine, the latent power within the fuel (gasoline vapor mixed with air) is released

by ignition of the fuel through an electric spark.

To bring about this electric spark, a system of batteries or generators, coils, timing apparatus, wires and spark plugs is used. In the diesel engine the Power Liberation phase of the combustion cycle is brought about through the well-known fact of physics—that high compression of air or a gas generates extremely high temperatures.

In a diesel engine, the ratio of compression of the air within the cylinder to the air without is controlled by the engine design so

that it reaches a high extreme of from 16:1 to 18:1. This compression of the air in itself generates a temperature of approximately 1,000 deg F, so hot in fact that it would melt tin within the cylinder.

At the apex of this high compression, liquid fuel is injected into the cylinder by a type of pump which is called the fuel injector. Fuel oil, similar to that burned in household furnaces, is forced under high pressure through tiny holes in the tip of the injector. The combination of high pressure and small openings "atomizes" the fuel, so that when it strikes the extremely high temperature within the cylinder it immediately starts to burn. This furnishes the gas expansion in the cylinder which creates downward thrust of the piston.

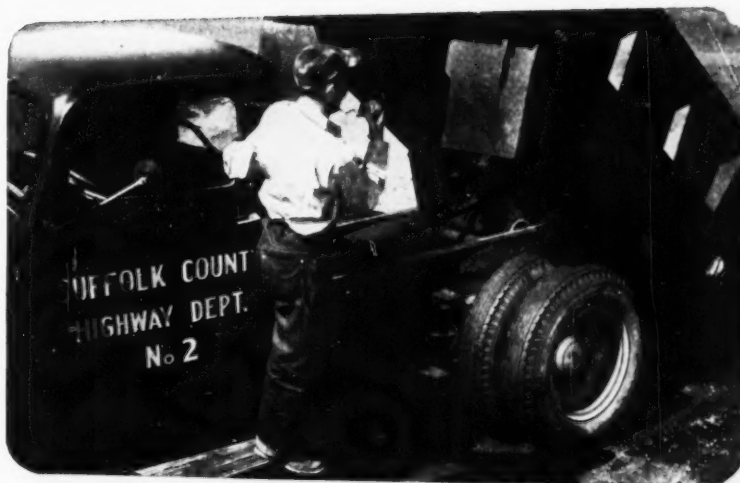
Four-Stroke Cycle

Fig. 1 (p. 107) shows in simplified form the four phases of the combustion cycle of a four-stroke cycle gasoline engine. In the first picture, the piston is shown moving downward and drawing the mixture of gasoline vapor and air from the carburetor through an open valve into the cylinder. This is known as the Intake stroke.

In the second (Compression) step, the piston is on its way up, compressing the explosive mixture within the cylinder. In this phase of the cycle, all valves leading into the cylinder are closed. When the piston has almost reached the top of the cylinder and the mixture has been compressed into a volume ratio of approximately 6 to 1, the spark plug comes into action and ignites the charge. The resultant rapid burning and expansion of gases forces the piston down and brings about the third phase of the cycle, the Liberation of Power.

The fourth phase of the cycle, or the Exhaust of Burned Gases, is accomplished by opening a valve as the piston starts upward again, so that the piston may force burnt gases out of the cylinder. After this is accomplished, the exhaust valve closes, the intake valve opens, the piston, carried by the momentum of the flywheel on the crankshaft, is again started downward, and the whole cycle is repeated.

In Fig. 2 (p. 107), 4 phases of the combustion cycle in a four-stroke cycle diesel engine are illustrated. As in the case of the gasoline engine, the piston accomplishes the first phase of the cycle in its down-



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DIESEL ENGINES ... Continued

ward stroke. There is this difference, however, in that in a diesel engine only air is drawn into the cylinder—and not a combustible mixture. The air is then so highly compressed in the second (Compression) phase of the cycle that a very high temperature is generated. Fuel is forced in through the injector, as described above, and is ignited by the heat within the cylinder, thus liberating, through the expansion of burning gases, the power within the fuel. The fourth phase of the combustion cycle in a four-stroke diesel engine is exactly the same as in a four-stroke gasoline engine.

Fig. 3 (p. 110) shows how 4

phases of the combustion cycle are made to take place in only two piston strokes in a two-stroke cycle diesel engine. It will be noted that this engine is constructed somewhat differently from the gasoline and the four-stroke cycle diesel engine described above.

In the cylinder wall near the bottom of the stroke of the piston, a series of port holes are provided. As the piston moves upward, the port holes are closed. These port holes serve as intake valves of the engine. The air which supports combustion of the fuel is forced in under pressure by a blower which itself is driven by the engine.

The two valves shown in the top

of the cylinder are both used as exhaust valves. This arrangement enables the two-stroke cycle diesel engine to accomplish the four phases of the combustion cycle, Intake, Compression, Power and Exhaust, in less time and with less pumping action of the piston than is necessary in the four-stroke cycle diesel engine.

WHY DIESEL?

• The outstanding reasons for the wide use of the diesel engine today are its proved economy, its inherent ability to convert a greater percentage of the heat locked up in a gallon of fuel into useful work, and the fact that diesel fuel contains 12.5% more Btu's (heat units) per gallon than gasoline.

Unlike most other types of engines, the diesel's fundamental high efficiency is not limited to full power capacity. Its thriftiness prevails over a wide range of partial load conditions.

The combination of these two allied factors means that if a comparison were made between diesel and engines of other types, assuming the cost of fuel per gallon to be the same, the diesel would still be the most economical to operate. In other words, the diesel delivers more horsepower hours per gallon of fuel consumed; 48% more on a continuous load, and an even greater savings under light load conditions.

The fuel used is compact, convenient to handle, easily stored and has less fire hazard than the more volatile fuels.

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Positive fuel injectors eliminate carburetor problems at low temperatures. Instant full-power availability and unmatched acceleration can be insured for powering emergency equipment.

As seen in Fig. 3, the Intake of the two-stroke cycle diesel engine is accomplished by forcing air under pressure by means of the power-driven blower through the intake ports when the piston is near the bottom of its up-and-down travel. When the piston starts upward, it closes the intake ports, the two valves in the top of the cylinder are closed and the air is compressed within the cylinder.

At very near the top of the stroke of the piston, fuel is forced into the cylinder through the fuel injector and begins to burn, causing the gas expansion which generates power. As the piston travels downward and most of this expansion has been utilized as power,

(Continued on page 114)



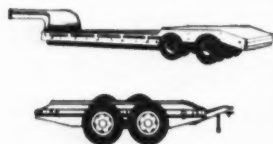
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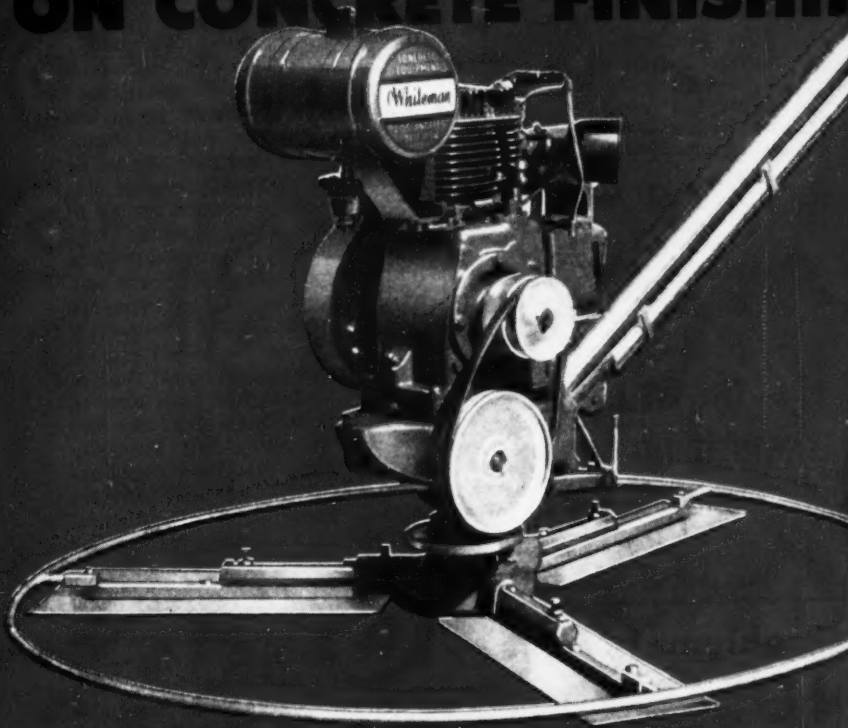
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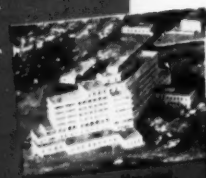
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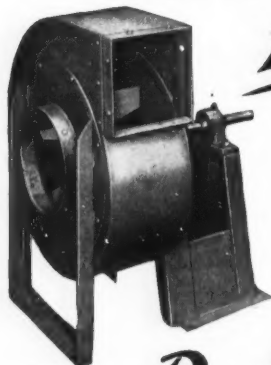
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DIESEL ENGINES ...

Continued from page 112

the exhaust valves open in the top of the cylinder and allow the burned gases to escape. This is the fourth or final phase of the combustion cycle. The escaping burned gases are hastened on their way by the opening of the inlet ports and the in-rush of fresh air under pressure from the blower.

The four phases of the combustion cycle have been accomplished in only two strokes of the piston. It is for this reason that this engine is called a two-stroke cycle, or "two-cycle" diesel engine, in which every downward stroke of the piston is a power stroke.

Considerable controversy has existed and probably always will exist about the relative efficiency and desirability of the four-cycle and the two-cycle diesel engine. There is probably a great deal of truth to be found on both sides of the argument. It is well known that the slower acting and generally heavier four-stroke cycle diesel has been found efficient and satisfactory in many fields of industrial and marine applications, including the generation of power in community lighting plants, and the propulsion of large boats and tugs where weight of the engine is of little consequence.

Efficiency and power-per-pound of the four-stroke cycle diesel also have been greatly increased by supercharging which brings about more thorough elimination of exhaust gases and some increase in Compression ratio. Through the development of the two-stroke cycle diesel engine a greater amount of power also may be obtained from a smaller engine, one which is lighter and occupies less space.

This type of engine has been found extremely adaptable to trucks, buses and construction equipment where space and weight are at a premium, and for many other applications where portability is a prime consideration.



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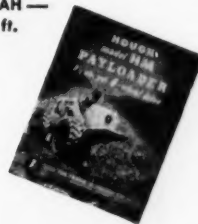
Last summer Bates and Rogers Construction Corporation successfully finished a tunnel for the B & O Railroad near Clarksburg, W. Va., in spite of very tough conditions created by an abandoned coal mine, shattered rock and high ground pressures. Two four-wheel-drive "PAYLOADER" tractor-shovels with $1\frac{1}{2}$ cu. yd. buckets were skillfully employed, both inside and outside of the tunnel. They handled all sand and gravel for concrete . . . removed spoil from the face . . . cleaned out ditches . . . carried and lifted tunnel steel, wood panel forms and channel tile . . . loaded trucks with limestone ballast.

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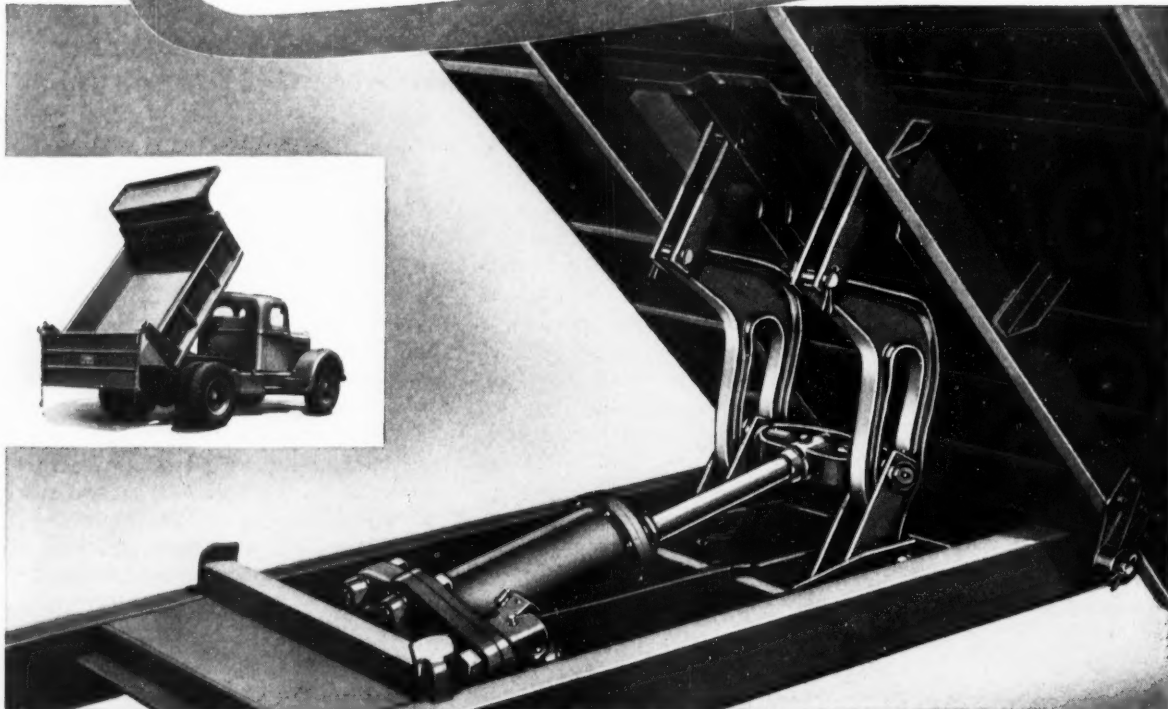
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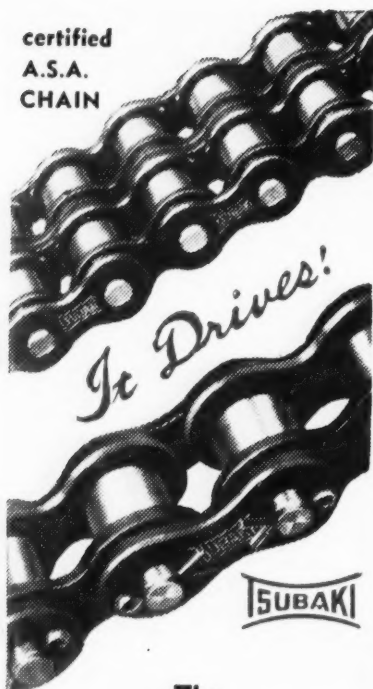
AN EARTHFILL DAM, 175 ft high across a steep canyon and Los Gatos Creek in the Santa Clara Valley of California, has been rushed to completion before heavy winter rains to prevent damaging floods and to conserve water otherwise wasted into San Francisco Bay.

The Guy F. Atkinson Co. concentrated a fleet of big equipment on the job and rushed it to early completion to impound 25,000 acre-ft of water sorely needed to bolster the rapidly dropping water table in the Santa Clara Valley, a highly productive agricultural region.

The finished project, Lexington Dam, has a maximum base width of 1,200 ft and tapers off to 50 ft at the top. A concrete spillway at one end is expected to carry off the largest probable flood on the creek.

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LEXINGTON DAM . . . Continued



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TWO ATKINSON D8s cut away at a side hill to block off the creek and build up earthfill to 175 ft. On the far side of the canyon a flume winds along on its way to bring water to City of San Jose. Part of this flume had to be moved to make way for Lexington Dam.

in concrete and winding down the rolling terrain of the valley. The pipeline taps the water by passing through the dam near its base, and flow is controlled by valves at the intake end.

The contract involved the excavation and moving of about 2,000,000 yd of material at a price of \$1,433,310. Los Gatos Creek, now being controlled by the new dam, was the last major source of water available to the Santa Clara Valley Water Conservation District. The district originally was formed to harvest waste flood waters from surrounding watersheds and charge them into the porous ground strata beneath the valley which form a handy underground reservoir.

Before construction of Lexington Dam could be begun, it was neces-

sary to relocate 1.77 mi of main highway around the site of the dam. Atkinson also won this contract—for some \$1,400,000—and moved approximately 2,000,000 yd of dirt.

This job included the largest highway fill in the history of California roadbuilding. More than one-half of the dirt moved was used on this one fill 800 ft long and with a maximum depth of 135 ft. At the same spot it was necessary to house a creek, running through fill, in a 120-in. concrete barrel, 840 ft long. The new highway has four lanes, a total width of 70 ft.

In addition, it was necessary to move a county road, a cable of the Pacific Telephone and Telegraph Co., and the San Jose Water Works flume and diversion dam.

in

1953

for the 16th Consecutive Year



ONLY AUSTIN-WESTERN POWER GRADERS
give you **ALL-WHEEL DRIVE** ***PLUS*** **ALL-WHEEL STEER**
the matchless combination that delivers unequalled performance

Austin-Western

**Power Graders
Road Rollers • Motor Sweepers**



Construction Equipment Division

Manufactured by
AUSTIN-WESTERN COMPANY
Subsidiary of Baldwin-Lima-Hamilton Corporation
AURORA, ILLINOIS, U.S.A.

MANITOWOC

MODEL 2000—1¼ YD.

Big Machine Performance plus small machine versatility

Here's a husky little 1¼ yd. machine with actual capacity of a larger size unit—plus the versatility and maneuverability of a smaller machine.

Working for R. L. Schutt & Co. of Indianapolis, a Model 2000 is paying its way every day through its superior performance and versatility on a bridge construction job near Winamac. It excavated for the foundations, drove the piles, set the sheathing and set the steel, including 19 ton sections. It handled the entire operation scrambling from site to site and job to job.

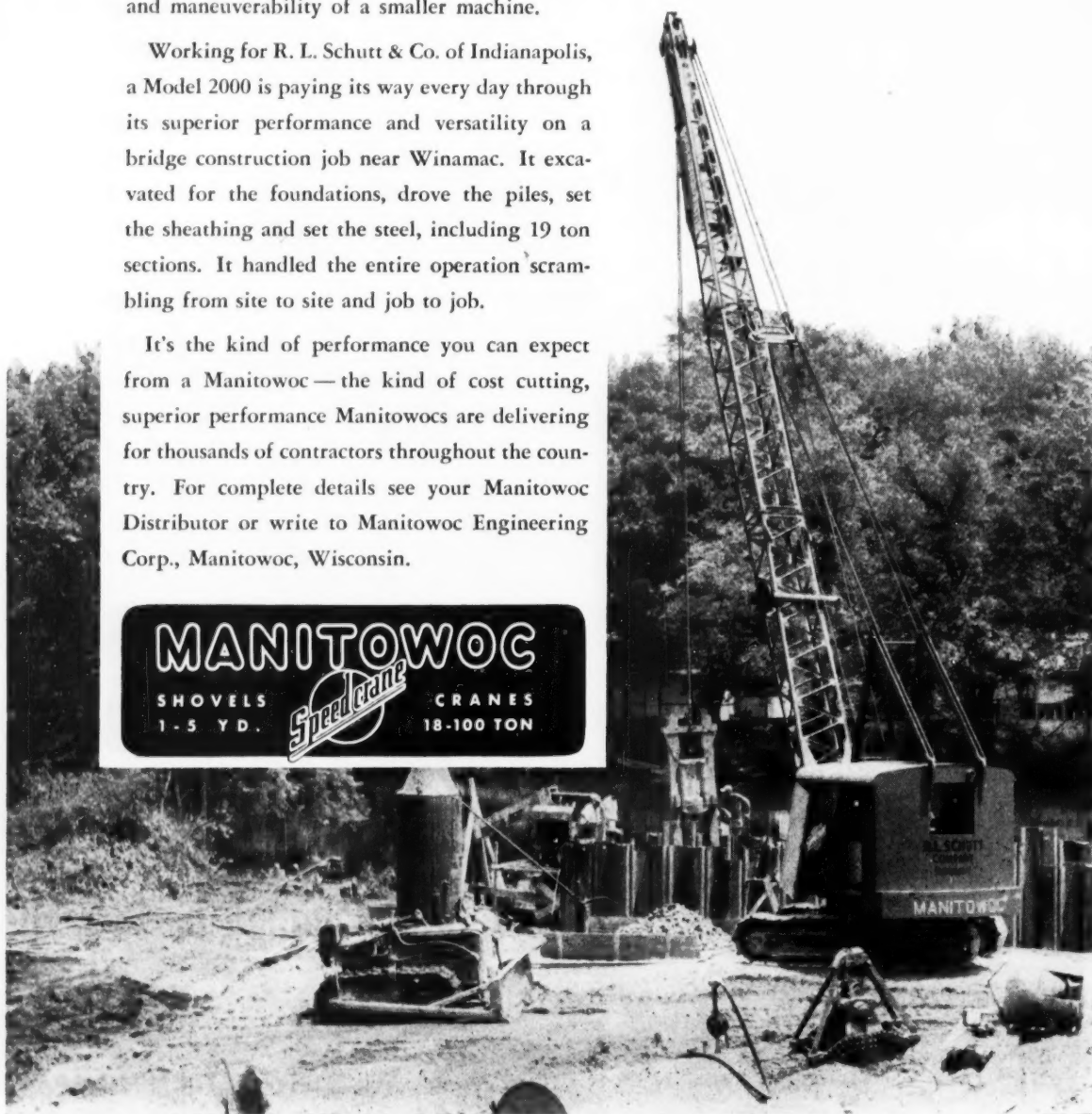
It's the kind of performance you can expect from a Manitowoc—the kind of cost cutting, superior performance Manitowocs are delivering for thousands of contractors throughout the country. For complete details see your Manitowoc Distributor or write to Manitowoc Engineering Corp., Manitowoc, Wisconsin.

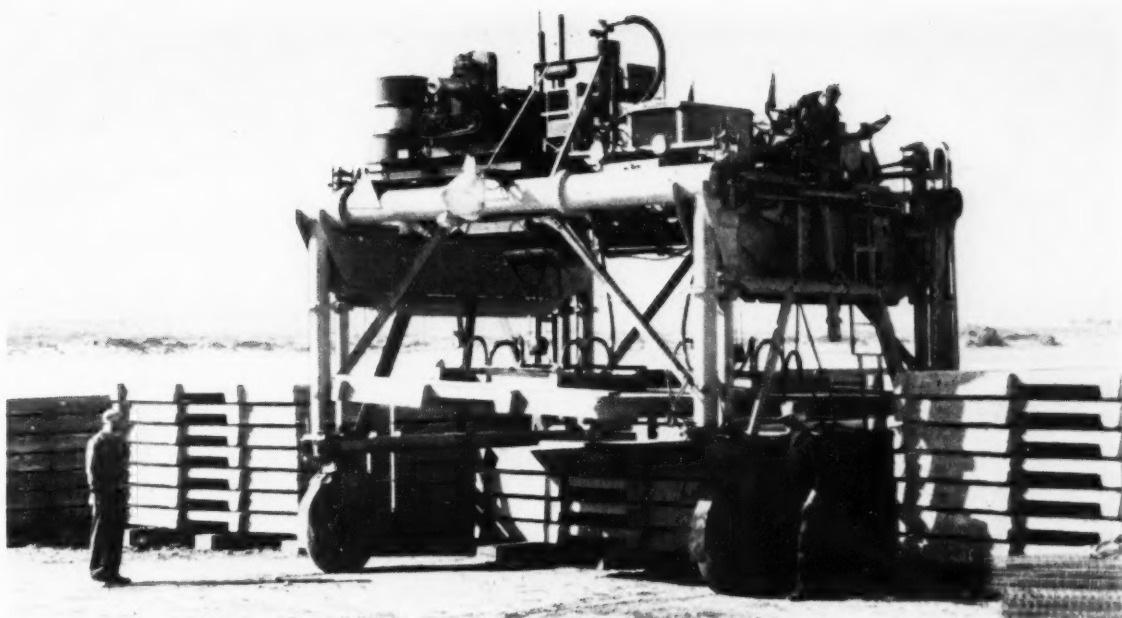
MANITOWOC

SHOVELS
1-5 YD.

Speed Crane

CRANES
18-100 TON





Concrete slabs are piled neatly and seven-high by ...

Outsize Straddle Truck in Casting Yard

AN OVERGROWN LUMBER CARRIER turns a neat trick to speed form-stripping and concrete slab handling for the mass-production casting yard at the 550-acre Twenty-Nine Palms Marine Corps Artillery Training Facilities in California.

The "Monster," as it is dubbed affectionately by its designers, was designed for joint-venture contractors, Twaits-Morrison-Knudsen-Macco, who are building 110 barracks and other buildings.

Most of the construction is of precast concrete units, walls being erected with the tilt-up method. Roof slabs—some 5,000 of them—presented a handling problem. They are cast flat, steam-cured for 12 hr, then stacked and air-cured for 14 days; all done on a continuous production-line basis.

Construction of an efficient slab-handling truck was assigned to the Conveyor Co., Los Angeles. Conveyorco engineers started with a Hyster CP 116 straddle truck. They widened it 5½ ft to give it 15 ft of inside clearance. Road clearance was upped from 6½ to 12 ft.

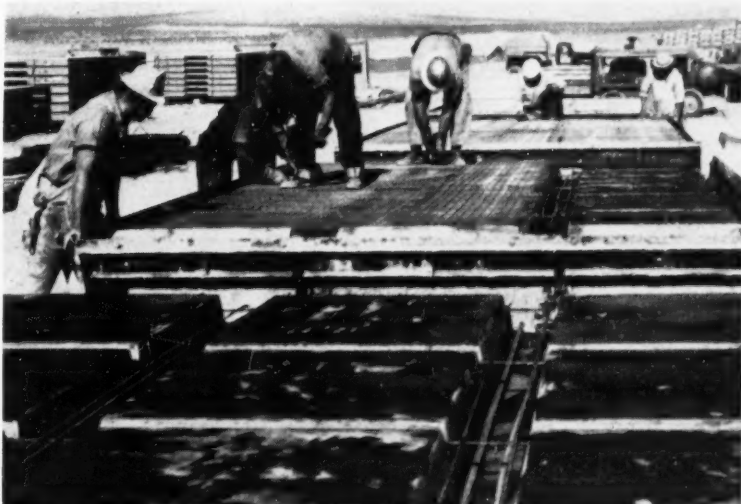
With its increased dimensions, the Monster quickly strips forms and transports the 1½- to 4-ton roof slabs, stacking them seven-high

for curing. Two 3-ton electric hoists installed on the vehicle are powered by a 10-kva generator.

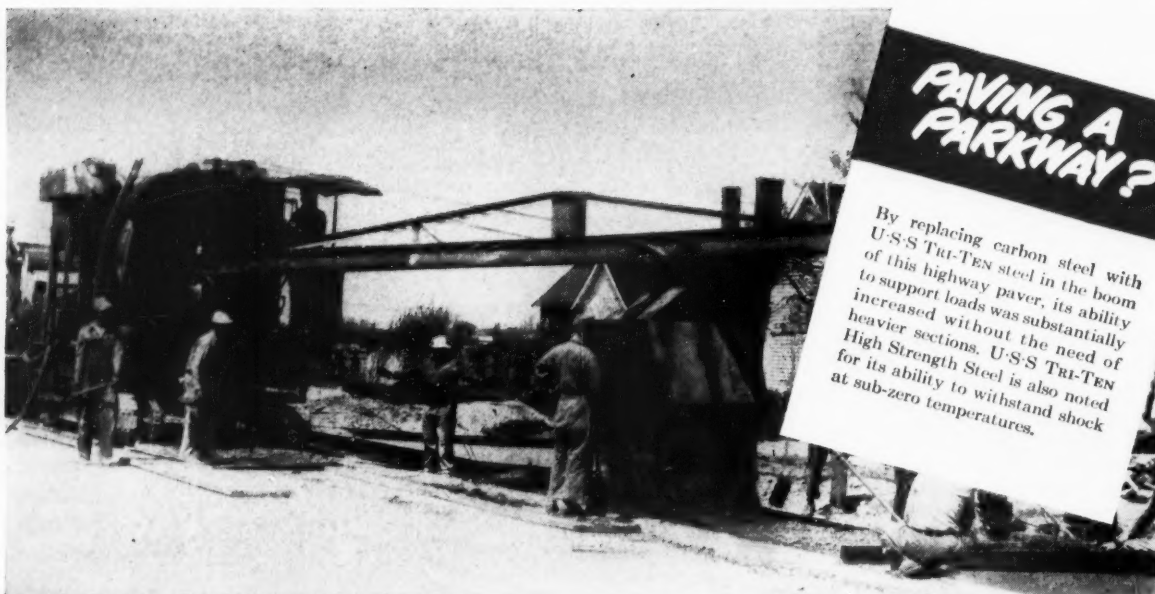
Hydraulic power steering was added to make handling easier under the heavier loads. In spite of these major changes, the straddle truck can be reduced to its original size and form by removing the extras added for casting yard duty.

The sequence of operations in which the special vehicle takes part consists of first stripping the slab from the form, then transporting and stacking in the curing area, where after an air dry of approximately 14 days, it can be delivered to a building under construction. Stripping forms and stockpiling

(Continued on page 126)



SLABS ARE CAST FLAT in rows of steel forms designed for fast stripping, curing and re-use. Here reinforcing steel is going in. Project calls for some 5,000 roof slabs.



PAVING A PARKWAY?

By replacing carbon steel with U-S-S Tri-Ten steel in the boom of this highway paver, its ability to support loads was substantially increased without the need of heavier sections. U-S-S Tri-Ten High Strength Steel is also noted for its ability to withstand shock at sub-zero temperatures.

If your equipment is built with U·S·S HIGH STRENGTH STEELS



DIGGING A DIKE?

This huge dragline is excavating clay and sand for a levee in Reynoldsville, Illinois. Its 100-foot boom was constructed with U-S-S Tri-Ten steel. The Baldwin-Lima-Hamilton Corporation has long used U-S-S High Strength Steels to give their equipment an unusual degree of ruggedness and durability.

it means a



faster, better, lower cost job!

AND HERE'S WHY!

U-S-S COR-TEN, U-S-S TRI-TEN and U-S-S MAN-TEN High Strength steels have a yield point 50% higher than that of ordinary structural steel. When you use them in the same thicknesses as ordinary steel, these high strength steels give you a tremendous increase in strength—give your equipment real backbone—without any increase in weight.

These famous steels also provide high resistance to wear, abrasion and impact. And if equipment must operate in sub-zero temperatures, or under corrosive conditions, they provide maximum resistance to these destructive forces, too.

These qualities in your equipment are as

important as money in the bank!

Here's what they mean to you.

You can do the job faster because there is less time lost for maintenance and repairs—you can drive equipment to full capacity and know it will stand up. *You can do the job better* because equipment will be stronger without being handicapped by unnecessary deadweight—it will be more mobile, faster on its feet, able to perform better. *And you can do the job at less cost* because repair, maintenance and replacement costs are minimized.

Give us a call, or drop us a note and we'll send you all the details on how you can use U-S-S HIGH STRENGTH STEELS to make your equipment more profitable and more useful.

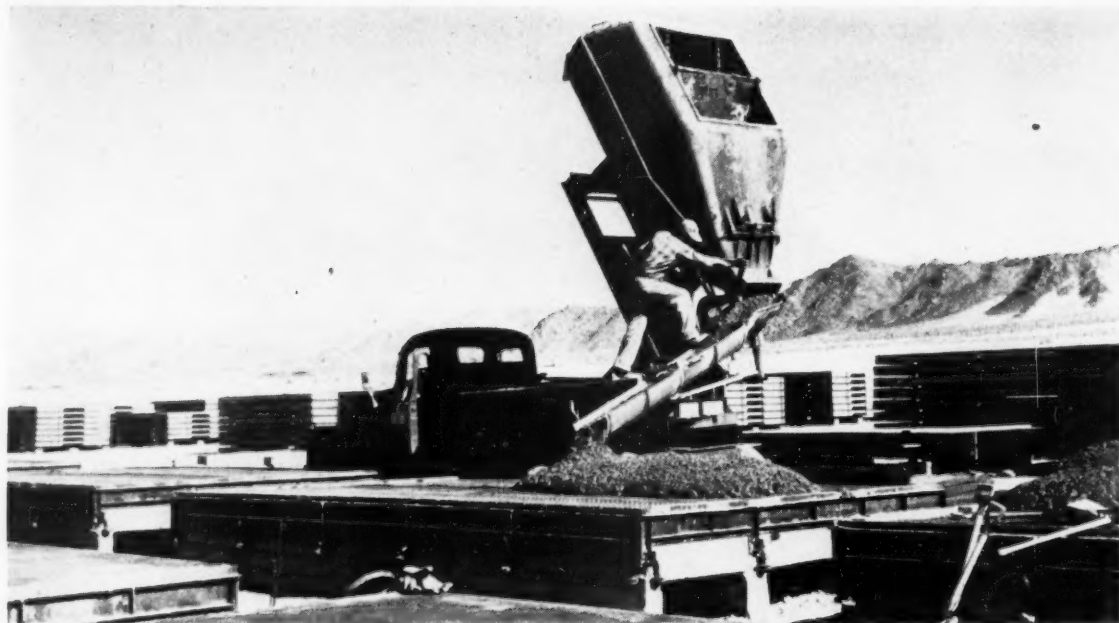
UNITED STATES STEEL CORPORATION, PITTSBURGH • AMERICAN STEEL & WIRE DIVISION, CLEVELAND
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • NATIONAL TUBE DIVISION, PITTSBURGH
TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. • UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

U-S-S HIGH STRENGTH STEELS



UNITED STATES STEEL

3-804



HIGH-LIFT BODY on International truck pours concrete, mixed on the site, which then is followed by an electric vibrator to get uniform concrete. Note neat stacks of curing slabs in background; each piece is kept separated from another by a transverse 2x4.

has been reduced to an 8- to 10-min cycle.

The vehicle is equipped with two vacuum gripping units supplied by the C. D. Wailes Corp. & Associates of Los Angeles. One-inch strips of special rubber around the bottom edge of the two gripping pads permit a suction grip to the slab of approximately 10 psi. One slab is carried at a time. The two pad units have an aggregate lift capacity of about 10,000 lb.

Each pad is fastened to a 3-ton electric hoist suspended by trolleys

from a beam above. By means of hydraulic cylinders connected directly to the hoists, each can be moved laterally, as required to position centrally on the slab. Longitudinal positions are fixed, each gripping the slab about the center of the forward and rear half.

Before pouring the slabs, forms are sprayed with an anti-bond compound to reduce adhesion of concrete to the steel form. An air-vibrated screed is used to assure uniform results. The slabs are then subjected to live steam curing

for approximately 12 hr and stripped on an 18- to 20-hr schedule. The Monster has become an essential part of the low-cost type construction being used on this project. Speed and maneuverability of the machine reduce handling costs by a gratifying percentage.

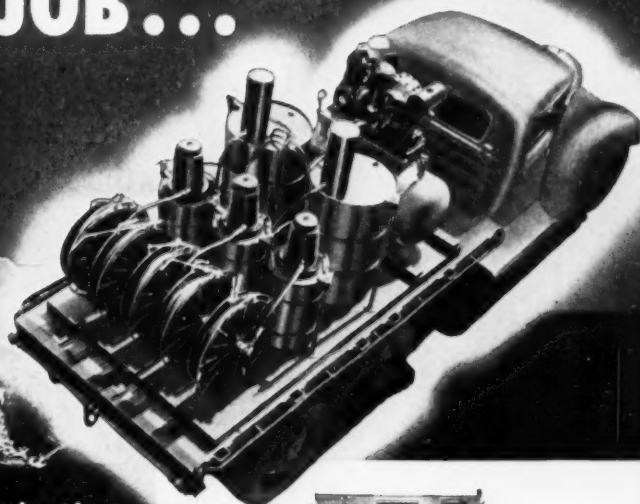
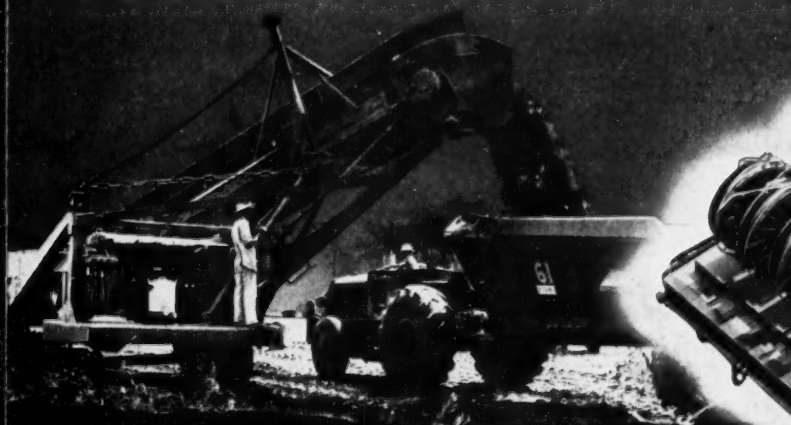
Concrete for this project is batched and mixed in a Conveyco 5-compartment mixing plant which has a 2-yd Koehring tilting mixer and a Conveyco recirculating bulk cement silo.



SCREEDING FINISHED SURFACE completes pouring operation. Next, slabs are steam-cured for approximately 12 hr (steam plant at right rear) and stripped on an 18- to 20-hr schedule. Straddle truck at left is in position to strip another form.

Alemite "Friction Fighters"

SPEED IN-THE-FIELD LUBRICATION ON THE NATION'S BIGGEST CONSTRUCTION JOB...



The Savannah River Atomic Energy Project!

315 square miles of land area is in preparation for the 1½ billion dollar Savannah River Project of the Atomic Energy Commission. Here is the nation's biggest construction job—and here are the most modern methods of earth moving, construction—and round-the-clock maintenance.

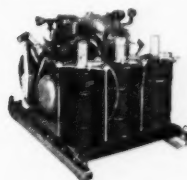
To service and lubricate the hundreds of pieces of heavy equipment—right on the job—anywhere in the field—15 Alemite Portable Service Stations were selected to save three ways—

1. **SAVE TIME!** By bringing complete power lubrication to all equipment right on the job—safely, efficiently.
2. **SAVE MONEY!** By cutting lubrication "down time"—increasing output of both men and machines—slashing operating costs.
3. **SAVE EQUIPMENT!** By greatly reducing the possibility of bearing failure—by keeping rigs running smoother longer.



Designed for Heavy Duty

For the biggest, toughest jobs. This is one of the 15 Alemite Portable Service Stations operating around the clock at Savannah River. These units feature rugged Alemite Pumps that deliver lubricant fresh and uncontaminated direct from "barrel to bearing"—end the need for frequent drum changing by using original 400-pound drums. Units include low and high pressure pumps, reels and hose for pressure gun grease, gear oil and air.



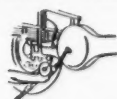
Sectionalized units for use with 100 pound drums also available.



Get These Four Services with Alemite PORTABLE SERVICE STATIONS



Fast, easy lubrication of track rolls and fittings.



Quick filling of gear housings, transmissions, final drives.



No oil wasted—use exact amounts of lube desired.



Air line equipment for tire inflating, air jet cleaning, etc.

ALEMITE



ALEMITE, Dept. PS
1850 Diversey Parkway, Chicago 14, Illinois

Gentlemen:
Please send me free your illustrated booklet containing complete information on Alemite Portable Service Stations and Alemite equipment.

Name _____
Company _____
Address _____
City _____ State _____

It's the Operators'



BEST BY A DAM SITE. Troy Hood and Jack Rank (shown here with Dirt Foreman Sam Crawford) operate TD-24s for Guy H. James, building the great Oahe Dam in South Dakota. Hood says: "I can keep right behind the scrapers—catch 'em sooner and push 'em out faster because TD-24 controls are easier." And Rank chimes in: "Much easier to handle than any other tractor."



"ALMOST THINKS FOR ITSELF!" That's what Jess Leatherwood says about the Big Red TD-24 he operates for Macon Construction Co., Franklin, N. C. "It pushes more, moves it faster and handles easier than any other crawler I've ever been on."



"WE RIP PLACES YOU'D USUALLY HAVE TO BLAST," says another Macon operator, Roy Cantrell. "We've been working in the Blue Ridge Mountains on rock you couldn't touch with a dozer till the TD-24 came along. Now we blade where we couldn't scratch before, and rip where we used to dynamite!"



"OUR TD-24s REQUIRE LESS SERVICE," says John Tickler, Service Superintendent for John E. Bloomer Construction Co. "These big red machines are very accessible, very easy to maintain. And when we do need help, the International Distributor is always on the job!"



Crawler!



Read what the operators and servicemen say about "Big Red", the International TD-24...



"HOW DO I LIKE 'BIG RED'?" asks George Miller. "Listen: This TD-24 is just the fastest and surest handling tractor there is, that's all! Nothing I've seen can touch it for moving dirt." George and his TD-24 move dirt in North Carolina for Kiker & Yount Construction Co.



"GREATEST THING I'VE SEEN," says Bruce Olson (right), TD-24 operator and Sec.-treas. of G. A. Olson Construction Co., Marshall, Minn. "The TD-24 is the easiest crawler of all to operate. The high-low shift is great for whipping around to the cut after dumping the load. It's the fastest equipment going for anything up to a 3,000-foot cycle!" Man in center is Glen Olson, Bruce's brother and company president. At left is Superintendent Donald Young.

Ask the men who know. Ask the operators. They know that *this* makes "Big Red" the Champ:

TD-24 POWER

148 maximum drawbar horsepower, more than any other crawler on the market.

TD-24 SPEED

Up to 7.8 m.p.h. with 8 forward speeds, 8 reverse. Moves loads faster, gets back quicker for more work-cycles per hour.

TD-24 STEERING

Fingertip control for pivot-turns, feathered-turns and *turns with power on both tracks.*

TD-24 STARTING

Exclusive International push-button starting for quick starts any time in any weather.

Want to know more reasons why the Big Red TD-24 is the work-champ of the world?

Ask your International Industrial Distributor. Ask TD-24 operators. Ask the men who know—and you'll be a TD-24 man yourself from then on in!

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS



INTERNATIONAL

POWER THAT PAYS



THERE'S A BIG

PLUS



THAT GOES WITH
EVERY PRODUCT
MADE BY

HOMELITE

When you buy a Homelite pump, generator, blower, or chain saw, you buy a superior product. You get outstanding performance and real dependability, the results of Homelite's 30 years' experience in manufacturing gasoline engine driven units. And with this, you get a plus . . . a big plus...service of unusual caliber. Covering the entire country, there are 45 Homelite factory branches . . .

fully staffed by Homelite men and completely stocked with Homelite parts. These factory branches are Homelite branches *exclusively* . . . servicing Homelite products *exclusively* . . . serving Homelite customers *exclusively*. They are established, located and equipped to bring factory precision service to you *in the field* . . . in the fastest possible way.

Manufacturers of Homelite
Carryable Pumps • Generators
Blowers • Chain Saws

PERFORMANCE • DEPENDABILITY
SERVICE

HOMELITE

CORPORATION

1003 RIVERDALE AVENUE • PORT CHESTER, N. Y.



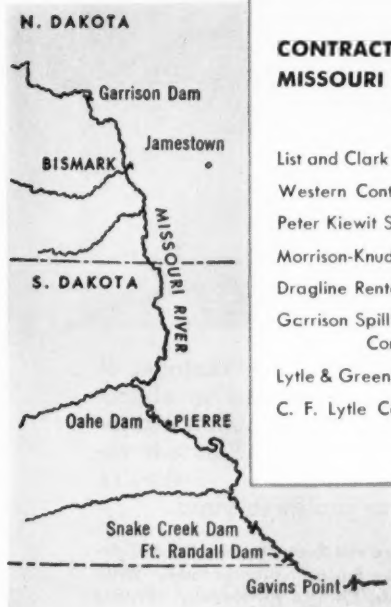
CALL
ANY OF THESE
HOMELITE
FACTORY BRANCHES FOR
PROMPT, EFFICIENT SERVICE

Albany, New York - Albany 5-1617
Atlanta, Georgia - Crescent 5845
Baltimore, Maryland - Chesapeake 0825
Bloomfield, Conn. - Hartford 7-0444
Bloomington, Ill. - Bloomington 2-7877
Boston, Massachusetts - Stadium 2-4455
Buffalo, New York - Fillmore 1515
Charlotte, N. C. - Charlotte 2-5855
Chicago, Illinois - Auburn 7-0246
Cincinnati, Ohio - Mulberry 1869
Cleveland, Ohio - Shadyside 1-6171
Dallas, Texas - Riverside 4679
Detroit, Michigan - Tyler 7-1811
Fresno, California - Fresno 4-5170
Glenallen, Virginia - Richmond 88-1179
Grand Rapids, Mich. - Glendale 2-9204
Harrisburg, Penna. - Harrisburg 5-6711
Houston, Texas - Preston 7371
Indianapolis, Indiana - Irvington 6447
Jackson, Mississippi - Jackson 3-8483
Jacksonville, Fla. - Jacksonville 3-5475
Kansas City, Missouri - Logan 9555
Los Angeles, California - Angelus 0186
Lufkin, Texas - Lufkin 8
Memphis, Tennessee - Memphis 4-1660
Milwaukee, Wisconsin - Hilltop 2-2505
New Orleans, La. - Temple 2707
New York, N. Y. - Cortland 7-2523
North Arlington, N. J. - Kearny 2-3500
North Salt Lake, Utah - Salt Lake 9-4216
Omaha, Nebraska - Atlantic 8085
Philadelphia, Penna. - Lombard 3-0614
Pittsburgh, Penna. - Allegheny 1-7263
Port Chester, N. Y. - Port Chester 5-3400
Portland, Oregon - Murdock 3309
Rochester, New York - Monroe 4676
Roseburg, Oregon - Roseburg 3-5295
Sacramento, Calif. - Hillcrest 6-6068
St. Louis, Missouri - Sweetbriar 3537
St. Paul, Minnesota - Prior 1852
San Francisco, California - Mission 8-6100
Seattle, Washington - Seneca 5742
Spokane, Washington - Keystone 7913
Syracuse, New York - Syracuse 2-7902
Toledo, Ohio - Jordan 8723

It's 89% "Euc"
on the Missouri dams!



An 11 yd. shovel loads 50-ton Rear-Dump Euclids in just over a minute at Ft. Randall Dam.



CONTRACTORS ON THE MISSOURI RIVER DAMS

List and Clark Construction Co.
Western Contracting Corp.
Peter Kiewit Sons Co.
Morrison-Knudsen Co.
Dragline Rental Co.
Garrison Spillway
Constructors
Lytle & Green Construction Co.
C. F. Lytle Construction Co.

The six big dams now under construction on the Missouri River comprise the largest earth moving project ever undertaken. More than 200 million cubic yards of earth and rock will be loaded, hauled and placed for these flood control and power dams in North and South Dakota.

At Oahe Dam, which will be the world's second largest earth fill dam, and also at Gavins Point and Jamestown Dams, 100% of the earth hauling equipment is Euclid. The contractors working on the other three projects—Fort Randall, Snake Creek and Garrison—are also using more "Eucs" than all other earth moving units combined.

The Euclid team that's helping to harness "Big Muddy"—Rear-Dumps, Bottom-Dumps, Loaders and Scrapers—gets the job done on schedule at the lowest cost per yard. That's why the contractors are using and depending upon "Eucs" to the tune of 89% of all their earth moving equipment. There are over 200 Euclids, ranging in capacity from 15 to 50 tons, making the dirt fly on these jobs.

Want facts and figures that show how and why "Eucs" move more loads per hour at more profit per load?

The EUCLID ROAD MACHINERY Co.
CLEVELAND 17, OHIO

CABLE ADDRESS: YUKLID

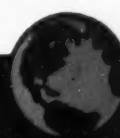
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EUCLIDS



Move the Earth

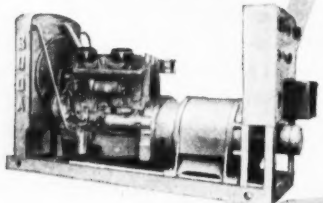


BUDA DIESELS

MONEY MAKERS **IN YOUR SHOVELS AND DRAGLINES...**



**EQUALLY
PROFITABLE
IN ALL YOUR
OTHER EQUIPMENT**



When leading Shovel and Dragline builders pick Buda Diesels to power their equipment they choose them for good reasons:—longer life, lower operating cost—minimum maintenance . . . more power . . . greater torque . . . extensive parts & service.

These same money-making advantages of Buda Diesels can be applied to almost every other piece of construction equipment you own. Don't miss a chance to re-power with Buda Diesels . . . they're designed with your profits in mind.

BUDA

Facts and performance sell Buda Diesels. Get full details from your nearby Buda Distributor today. Write for Bulletin. *The Buda Company, Harvey, Illinois*

There's a Buda Diesel for Every Need

BC-23

Manufacturers of Material Handling Equipment, Lifting Jacks, Maintenance of Way Products, Earth Drills and Diesel and Gasoline Engines

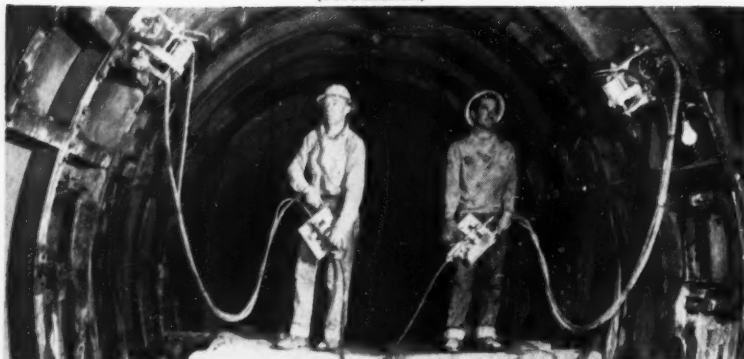


What You Should Know About Rope

Rope used on construction jobs will last longer and give a safer and more dependable performance if a few simple rules are followed governing its selection, care and handling.

By JOHN DURGIN, Field Engineer, Plymouth Cordage Co.

(Continued on next page)



VIBER EXTERNAL VIBRATORS with quick-acting mounting clamps prove very effective in producing unusually smooth concrete tunnel linings.

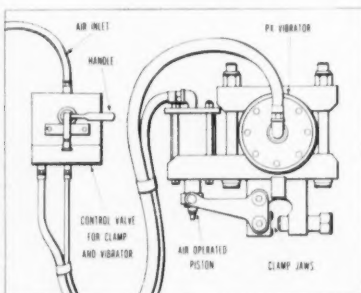
Form Vibration Speeds Tunnel Lining, Gives Better Concrete, Smoother Finish

Tunnel lining contractors now use VIBER external vibration on movable steel forms to speed production of denser, more uniform concrete and a finished surface almost as perfect as the form itself. This gives maximum capacity with minimum frictional losses in diversion tunnels, storm drains, or other water-carrying structures. Generally one vibrator is clamped on each side of the steel form (which transmits the vibration) at a height

convenient for clamping and moving as work progresses. One USBR project engineer reported transmission of vibration "throughout length of the slope—20 to 25 feet." Vibrators clamped near upper end of the advancing slope may be turned on briefly to help settling while concrete is deposited, after which a vibrating time of ten to forty seconds, depending on conditions, will consolidate it and produce the surface required.



AIR-OPERATED MOUNTING CLAMP and operating valve provide a quick and convenient means of clamping the external vibrator on the form wherever a plate or angle is accessible. Valve (left) turns the vibrator on and off, and operates the air piston to provide a clamping force of 1800 pounds on the adjustable jaws.



UNLOADING BULK CEMENT is one of many other successful applications of external vibration. One large oil well cementing company uses vibration to unload bulk cement in over fifty plants, some handling as much as 500,000 sacks per month. If you handle or package bulk materials, you can probably use external vibration to good advantage.

EXTERNAL VIBRATION is another field in which VIBER has pioneered in its continuing search for new knowledge and techniques in the useful application of vibration. For further information on VIBER'S complete line of internal and external vibrators, write your nearest authorized distributor or VIBER COMPANY, 726 South Flower St., Burbank, California.

Dept. 68

How to Select Rope

• **Construction**—How rope is constructed has a definite effect on all its properties such as tensile strength, abrasion resistance and flexibility. Rope is manufactured by twisting fiber into yarns, the yarns into a strand, and then twisting three or more strands into a complete rope. By controlling the amount of twist, a rope can be classified as either hard, standard, medium-soft, soft or extra soft.

For most uses a standard-lay rope is the best. A hard rope has less strength, more abrasion resistance; a soft rope handles easily but abrades more readily. Consult your supplier on the type best suited for your needs.

• **Materials**—Another factor in selection of rope is the material from which it is made. These break down into two categories; natural fibers (manila, sisal) and synthetic fibers (such as Nylon, Fiberglas).

Natural fiber ropes are most generally found in use for construction work with manila being the best all-around fiber. It is 25% stronger than sisal. Nylon is stronger than manila with 1½ to 2 times the tensile strength of the natural fiber, but it has four times manila's working elasticity, which makes it good for some uses, unsuited for others.

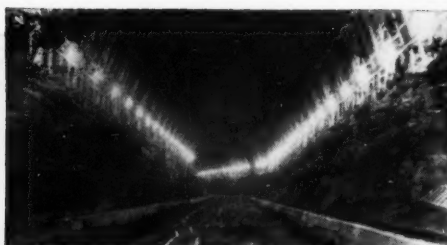
• **Sizes**—The third factor in selecting rope is the question of size. You order rope by size, that is its circumference or diameter, but actually you are interested in strength. Consult the manufacturer's size and strength specifications to insure that you are ordering the rope that will do the job you want it to do.

How strong should a rope be? Good practice dictates a 5 to 1 ratio between the rope and the load it is to lift, when the rope is new. If you intend to lift a load of 1,000 lb you should have a rope with a minimum breaking strength of 5,000 lb. As the rope grows older, that ratio should be increased. After six months of ordinary use make it 10 to 1. If the rope shows abrasive wear, increase the ratio further, depending upon its condition. If the rope shows serious flaws, don't use it!

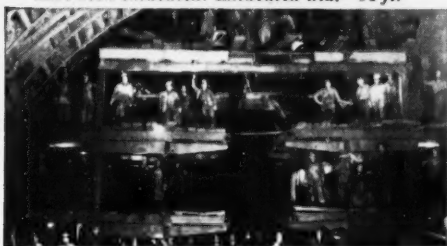
How to Pick Accessories

• **Pulley Blocks**—The strength of the block, not the strength of the rope, determines the load limit. A

(Continued on page 137)



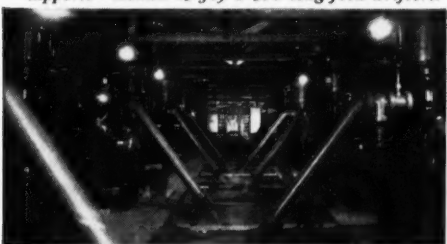
● Full heading after both top heading and bench have been excavated. Excavated dia.—51 ft.



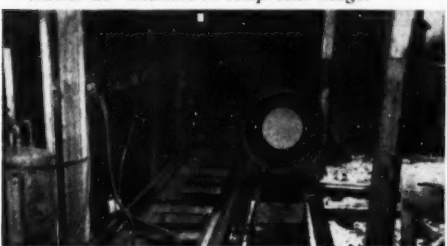
● Main Jumbo for driving top heading—mounts 17 T-350 long-feed drifters on Joy Hydro Drill Jibs.



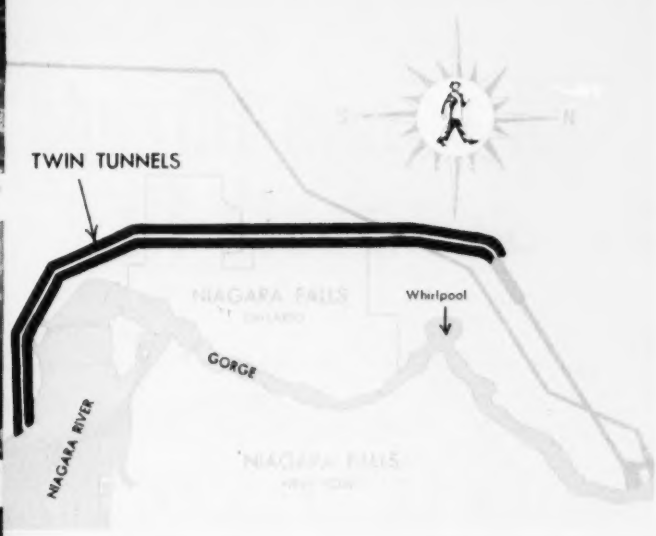
● Jumbo for bench drilling—suspended from roof supports—mounts 13 Joy T-350 long feed drifters.



● 8 Joy WN-102 compressors—referred to by contractor as "ultimate in compressor usage."



● Series 1000 Axivane Fans in ventilation arrangement. Tracks permit adding fans as desired.



PROGRESS REPORT ON THE WORLD'S LARGEST TUNNEL

SIZE Twin Tunnels 51' Dia., 5½ mi. length.

LOCATION Niagara Falls, Ontario.

EQUIPMENT USED (All Joy Installation):

114 T-350 Drifters on LW-6A Feeds on Hydro Drill Jibs.

24 WN-102 Semi-Portable Air Compressors.

Series 1000 Axivane Fans—added as needed to maintain air volume.

The world's largest tunnel is being bored out of *solid rock* with the help of Joy rock-drilling equipment, ventilating fans and air compressors.

4,375,000 cu. yds. (9,923,000 tons) of rock will be excavated to form the huge twin tunnels. These 5½ mile tunnels will convey water from the upper Niagara River beneath the city of Niagara Falls, Ontario, to a point near the Whirlpool Rapids, well below the Falls. Water thus diverted for hydro-electric power purposes would supply the water needs of 200 million people!

This is the first large tunnel operation where drilling has been mechanized. The "All Joy Equipment" installation confirms Joy's position as leader in the heavy construction and tunneling equipment market. **Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.** In Canada: **Joy Manufacturing Company (Canada) Limited, Galt, Ontario.**

*Consult a Joy
Engineer*



W&D C 4567

JOY

**WORLD'S LARGEST MANUFACTURER OF
UNDERGROUND MINING EQUIPMENT**

**Accurate threads
for smooth fit**



Bethlehem supplies every type of Fastener

ROPE . . . Continued from page 134

good rope is always stronger than the block for a given size of pulley or sheave. Always use the largest diameter sheave practicable. The larger the diameter the less internal friction on the rope. Two main causes of rope wear are too sharp a bend and a block with too little clearance.

• **Splices**—A knot should not be used to join ropes permanently. Always splice. Here's why: A knot retains only about 50% of the strength of the rope, a properly made splice 85 to 95%.

The "short splice" is the easiest to make—and it is a temptation to use it—but it should be avoided wherever its added bulk would cause serious chafing or wear. The thin "long splice" is best for pulley work, "short splices" for slings. An "eye" splice should be used for permanent ring fastening. The free ends of a rope should always be bound or "whipped" to prevent unravelling.

How to Use Rope

• **Uncoil Carefully**—Good rope usage starts when the new coil arrives. Kinks weaken rope. To avoid them, lay the new coil on the floor with the inside end on top; unwind right-laid rope counter-clockwise. If it uncoils clockwise, turn coil over, pass the end through the coil, and uncoil.

• **Reeve Properly**—Align rope properly in sheaves to prevent chafing against pulley blocks. When either block of a pair has more than two sheaves, the hoisting rope or "fall" should lead from one of the center sheaves. This prevents tipping of the block and damage to the rope from cutting across the edges of the block shell.

• **Keep Rope in Balance**—Adding or removing twist from a rope destroys its balance. Too much twist results in kinks, too little causes the strands to harden, lowers strength. Throw twist in or out as needed.

• **Don't Overload**—Excessive overloading stretches a rope—shortens its life. Those using rope should be instructed on how to determine safe loads for various conditions in pulls, fastening, or slings. Manufacturers will supply easily read tables showing the effect of angle of pull and number of legs on working load. As a general rule, don't use slings or lashings at an angle

greater than 45 deg from a straight pull.

• **Avoid Surface Wear**—Don't drag rope on ground. Grit and sand cause surface abrasion and will work into strands and cut fibers. Don't drag or rub one rope over another or over rough objects.

• **Avoid Sharp Bends**—Sharp bends reduce tensile strength by straining outer fibers. Avoid tying or pulling rope over sharp corners; if necessary, cushion corners with burlap.

How to Inspect Rope

• **New Rope**—Rope can be stored or handled carelessly in the period between its leaving the manufacturer and reaching you. Inspect carefully. Manila rope should be hard but pliant, feel smooth and silky, have a yellow color with a silverish or pearly luster, be clean and unspotted. Sisal should be yellowish-white with a possible greenish tinge but no gloss. Hemp is softer than manila usually gray in color.

(Continued on next page)

"DUMPCRETES WERE A NATURAL FOR THE FORT KNOX HOUSING PROJECT"

says S. D. Zenor, New
Albany (Ind.), concrete
sub-contractor



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2-yd CMC Mixer set
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"32,000 yards is a lot of concrete," says Mr. Zenor, "especially when you make your pours in close quarters."
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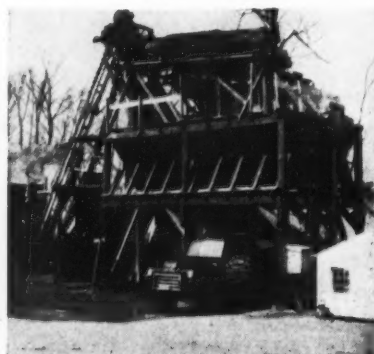
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Clean Sand and Gravel need not cut your job-profits! Get them at **LOWEST COST** and get them **CLEAN** with Reliance Units—strong, simple, rugged, greatly improved for today's faster operation. With Reliance Units you can build exactly the right plant to meet your requirements, and it can be easily moved anywhere. Let us tell you more about Reliance Advantages—write for Catalog 48.

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ROPE . . . Continued

• **Used Rope**—Inspection routines vary as follows:

1. Inspect before and after each project.

2. Inspect daily when rope is used on any jobs where it may be exposed to chemicals.

3. Inspect monthly when in regular daily use.

• **What to Look for**—Inspect the entire length watching for signs of external and internal wear, deteriorations of any kind. In particular check:

• **External Wear**—Abrasions, cut or broken fibers. Small rope should be discarded if surface yarns show much wear. Larger rope, with more yarns, can be used until outside yarns have worn somewhat deeper.

• **Internal Wear**—Variations in size or roundness of the strands probably mean torn or cut fibers. To check, unwind (throw out twist) and examine inner surfaces of strands. White powdery residue is caused by grinding of fibers, a danger sign.

• **Deterioration** — Color provides the clues. Chemicals or animal excretions will burn brown or rusty spots into rope. Watch for any signs of discoloration or dry rope. Cut out damaged sections and resplice. As a general rule, a rope that has lost its luster, is discolored, or has a musty odor is no longer safe. If rope no longer feels pliable and has lost its stretch and if it is dry and brittle, it should probably be discarded. Normally rope will deteriorate about 30% in two years from continuous weather exposure alone. Loss of strength from actual usage must be added to this.

Tips on Rope Care

• **Storage**—Never store a rope in a damp place. Best storage is in a cool, unheated, dry room with free-air circulation. Place rope in loose coils and hang on wooden pegs, if possible.

• **Washing**—If the rope gets dirty, it should be washed and dried before re-use or storage. Wash the rope in clean water. You can hang it in loops over a bar and hose it.

• **Drying**—Never store a wet rope but don't dry against radiators, steam pipes or other heat units. To dry, hang it in a good storage area and allow it to dry naturally.

• **Wear**—Reverse the rope ends periodically to increase its life.

• **Exposure**—Always protect rope from exposure to any chemicals that might be in use around a project.

• **Final Cautions**—Don't lubricate rope. A well-made rope has been properly lubricated by the manufacturer.

How to Determine Rope Size for a Given Load

To find the pull on the fall rope needed to lift a given weight—divide the weight by the number of ropes, or parts, running from the movable, or lower block and you'll get the theoretical pull required on the fall. However, a friction loss of about 10% for each sheave 3 in. dia or larger, in both fall and movable blocks, should be added.

Example: Load to be lifted is 5,000 lb. Tackle consists of two double blocks, 4 sheaves, 4 rope parts at the movable block. Mechanical advantage, 4. Friction loss, 4 sheaves: 40%.

$$5,000 \text{ lb} \div 40\% = 7,000 \text{ lb}$$

$$7,000 \text{ lb} \div 4 = 1,750 \text{ lb}$$

Pull needed on fall—1,750 lb

Assuming the rope is comparatively new, a safety factor of 5 to 1 is desirable. So $1,750 \times 5 = 8,750$ -lb rope strength required. Referring to manufacturers' tables, manila rope 1-in. dia, with a minimum break of 9,000 lb, is a safe rope size to use.

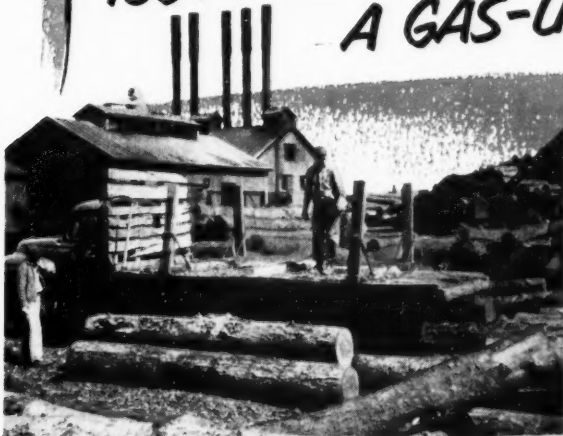
Reeve It Right

The tackle ordinarily used for hoisting, lowering or moving heavy objects consists of two blocks and a rope. One of the blocks always has a becket opposite its hook or shackle end—to which one end of the rope is fastened.

Where both blocks have the same number of sheaves, the becket is on the fall-block. Where the number of sheaves in the blocks differs the block having the smaller number carries the becket. In reeving, what is to be the becket end of the rope should be passed through the blocks away from the fall and toward the becket. This eliminates having to pull all the rope through all sheaves of the blocks.

When one of a pair of blocks has more than two sheaves, the hoisting rope, or fall, should lead from one of the center sheaves, to
(Continued on page 140)

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136 MILES DAILY... WITHOUT
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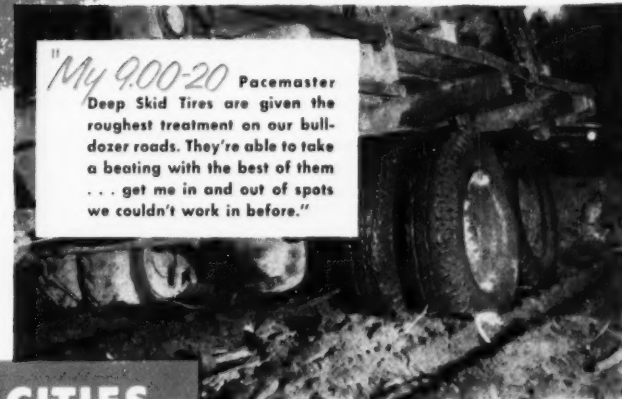
*Oscar
Riendeau*

**NEW HAMPSHIRE LOGGER, GETS GREAT
TRUCK AND BULLDOZER PERFORMANCE WITH
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Riendeau says, "Since switching to Cities Service Gasolene and Oil, I can make two round trips to the lumber mill, some 136 miles, without a gas stop. We couldn't do that before."



"My Truck runs as many as 18 hours a day over the toughest kind of going. I've found that Cities Service Triple HD Koolmotor Oil gives top performance under the tough conditions found in my operation."

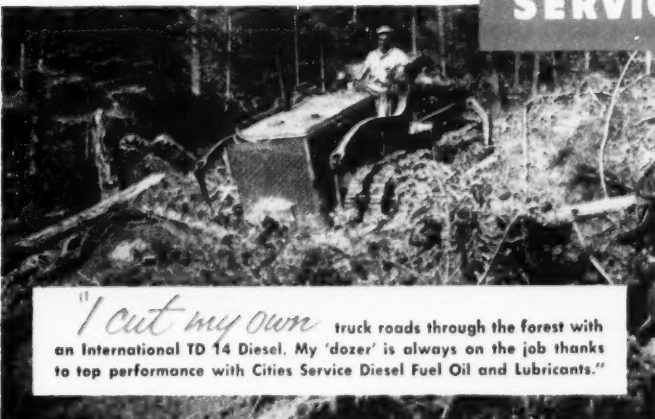


"My 9.00-20 Pacemaster Deep Skid Tires are given the roughest treatment on our bulldozer roads. They're able to take a beating with the best of them . . . get me in and out of spots we couldn't work in before."

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"On the basis of the success I've had with them, I recommend Cities Service Products for the most rugged jobs as well as the lighter types of trucking."



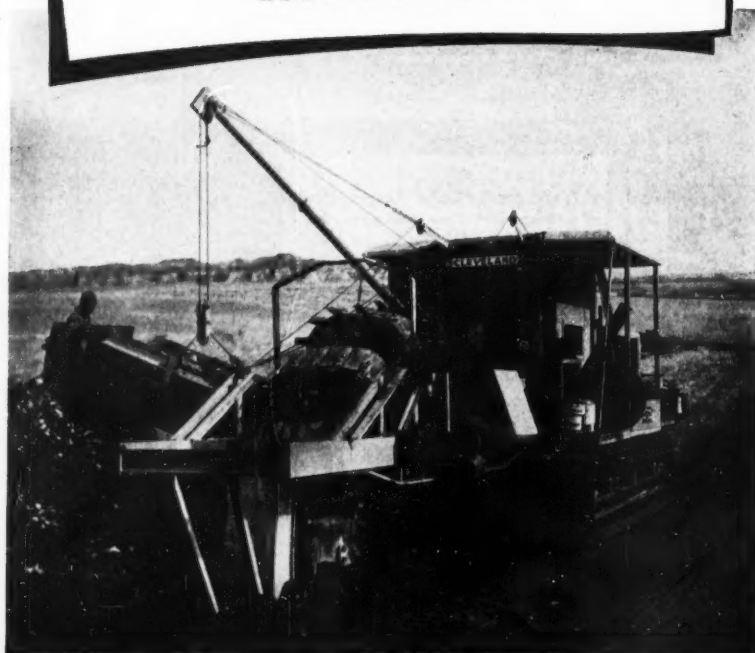
"I cut my own truck roads through the forest with an International TD 14 Diesel. My 'dozer' is always on the job thanks to top performance with Cities Service Diesel Fuel Oil and Lubricants."



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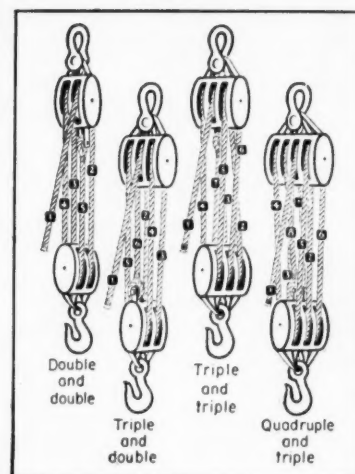
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ROPE . . .

Continued from page 138

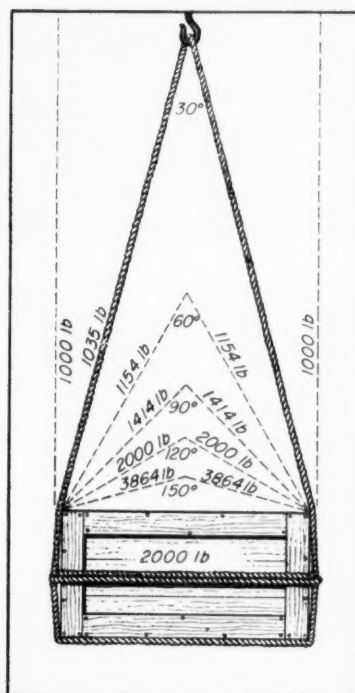


keep the hoisting strain on the center of the blocks. The upper and lower blocks then will be at right angles to each other. This prevents toppling and possible injury to the rope from cutting across the edges of the block shell.

For heavy work, or on permanent attachments, use a shackle block. Remember, too, that maximum strain on the rope is produced by the smallest sheaves.

Angle Pulls

The accompanying diagram shows different weights of pull ex-



erted on slings of various angles for a 2,000-lb load.

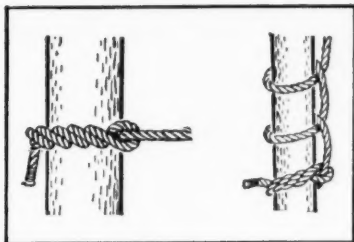
Note that the load on the rope is the same as the load being lifted only at 0-deg angle—or a straight pull. At a 120-deg angle, the load on the rope is doubled, and is almost four times as great with an angle of 150 deg.

There is real danger to life and property, and an absolute disregard for rope economy, when slings or lashings are used at an angle greater than 90 deg. As for the condition of the rope, suppose you had a 3-in. sling in use for 6 months. It looks good but often has been under heavy strain. Play safe and class it at less than its original strength—according to its condition.

Know Your Knots



The bowline: Sometimes called "the king of knots," the bowline never slips if properly tied. To tie it, lay the end of the rope over standing part to form an over-hand loop. Pass the end up through the loop, then up behind the standing part—then down through the loop again. Draw up tight.



The timber hitch: A simple, convenient hitch which does not jam, and unties readily. Used mainly to tow or hoist cylindrical objects, it is also useful in handling other shapes. To tie, pass a rope around the object, take a turn with the end around the standing part. Then, turn the end back on itself
(Continued on page 144)



Utilizing Twin Disc Clutches in all of its mobile equipment, Blaw-Knox carries out in its power link policy the "complete package" principle it advises to users of paving machinery.

From Precision Subgraders to Bulk Cement Plants, Truck Mixers, Concrete Spreaders, Concrete Finishers, and Concrete and Black Top Pavers, Blaw-Knox equipment goes to work through Twin Disc Heavy Duty Clutches—usually two or more in each of these multi-operation production-speeding machines.

Throughout the years leading manufacturers and users of production machinery have specified Twin Disc as the source of trouble-free, long life Friction and Hydraulic Drives—proved in performance—backed by the most complete and thorough service in the field.

Patterson Paving Co., Monongahela, Pa., contractors, used Blaw-Knox Complete Package Paving Equipment on western extension of Pennsylvania Turnpike—including 20-25' Precision Subgrader (above) and 20-25' Concrete Spreader, 20-25' Concrete Finisher and 34-E Paver (top). A total of 8 Twin Disc clutches are used in the above equipment, including the Model EH (top), the Model MTU (center) and the Model CL (bottom).

Built for a Long Life . . .
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OKAUCHEE, WISCONSIN

December 8, 1952

Unit Crane & Shovel Corp.
6411 West Burnham Street
Milwaukee 14, Wisconsin

Gentlemen:

We have operated UNIT equipment for over 20 years using all sizes—3/8, 1/2, and 3/4 yard. We now operate two 1/2 yard UNITs and one 3/4 yard UNIT. Two of these machines are equipped with gasoline engines and one with a Diesel engine.

We recently had the opportunity of using a fourth UNIT for many weeks which was equipped with UNIT Torque Drive. We operated it in dragline, shovel, trencher, and clamshell work. Depending upon the nature of the jobs, we have calculated saving in gasoline consumption all the way from 30 to 40 per cent. There is no question in our mind that maintenance costs are also reduced, and we regard the UNIT Torque Drive installation as one of the finest improvements you have offered.

All of the engines in these machines have been equipped with hour meters, and we feel that our acquaintance with UNIT equipment permits us to make reliable comparisons.

Yours truly,

VOGT, INCORPORATED

Edw. L. Vost
President

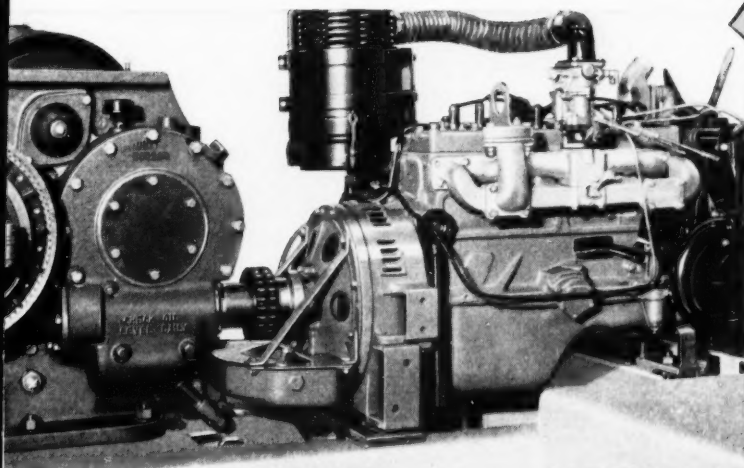
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UNIT TORQUE DRIVE



UNIT machines are available in 1/2 and 3/4 yard Excavators and Cranes up to 20 Tons ... Crawler or Mobile Types ... Gas or Diesel ... Fully convertible to ALL attachments. Write for descriptive literature.

Reports from numerous operators of UNIT excavators show that gasoline consumption averaged more than three gallons per hour without a Torque Converter.

In the same kind of operations, machines with UNIT TORQUE DRIVE are averaging as low as two gallons per hour. This SAVING is more than thirty per cent while the work output is increased.

The drive is accomplished by "Direct-in-line" mounting of Chrysler IND 16A or 19A engines, Chrysler Torque Converter, and a flexible coupling directly connected to a power take-off assembly with worm drive. The engine operates almost continually at its most economical speeds and is never burdened. The Torque Converter builds up line pull, eliminates shock loads, and reduces maintenance costs. The operation of the worm drive is silent and efficient.

Time-Saving, Cost-Reducing Advantages

- Greater work output without increasing fuel consumption
- Eliminates "shock loads" on machinery, reducing maintenance cost
- Smoother and more accurate control of all operations
- Builds up line pull without excessive load on engine
- Full steady power for peak loads without stalling engine
- Quick engine pickup retains maximum line speeds
- Provides "regulated load handling" by throttle control
- Increases lugging power for hard excavating
- Engine clutch eliminated entirely
- Installation available at NO EXTRA COST.

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MILWAUKEE 8, WISCONSIN

December 3, 1952

Phone 10-80-108

Unit Crane & Shovel Corporation
6411 West Burnham Street
Milwaukee 14, Wisconsin

Gentlemen:

I have been exceptionally well pleased with the performance of my UNIT 357 Mobile Crane, now equipped with UNIT Torque Drive. Previously it was powered by a gasoline engine without a torque converter and consumed 25 to 30 gallons in a day's operation. After changing to UNIT Torque Drive, our gasoline consumption dropped to 16 to 18 gallons per day.

I firmly believe that the saving accomplished with UNIT Torque Drive can be conservatively estimated at 30 per cent or more, because, in my case, I'm making comparisons with the same machine, same operator, and doing the same type of work. The engines were at all times equipped with hour meters.

Very truly yours,

F. A. GOLL COMPANY

FAG:ND

F. A. Goll
President

UNIT CRANE & SHOVEL CORP.

6305 W. BURNHAM STREET

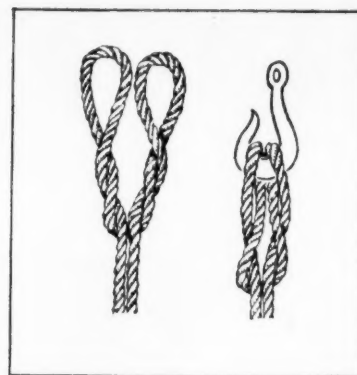
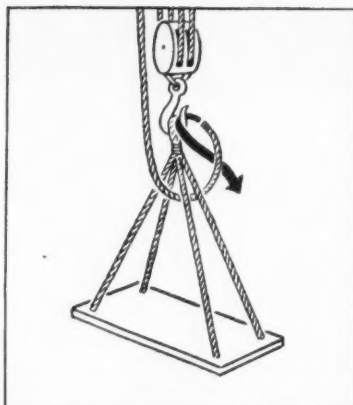
MILWAUKEE 14, WISCONSIN, U. S. A.

• CLAM SHELLS • TRENCHES • MAGNETS

two or three times, the turns following the lay of the rope. For greater security, or heavier loads, a half hitch is usually added as shown. Make the half hitch first.



Boatswain's hitch: A simple hitch used by most workmen who have to go aloft, like riggers, painters, steeple-jacks. To tie, a bight is pulled forward under the eye support for the chair, ladder or plank. Then a half-turn forms the single hitch required on the hook of the block.

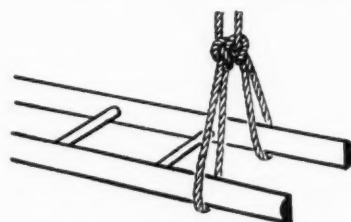


The cat's paw. A very satisfactory hook commonly used in slings for heavy hoisting. Doesn't jam and unties itself when removed from the work. To tie, grasp two bights held well apart—and twist each of them away from you. The two loops thus formed are then brought together and placed over the hook.

The clove hitch: This popular hitch provides a simple method for fastening rope around a spar, plank, or other object. It is sometimes called the "builder's hitch" because



of its extensive use in fastening staging to up-rights. To make it, pass the end of the rope around the object, a spar for example, then over itself; then over and around the spar, and pass the end under itself and between the rope and the spar as shown. Tighten by pulling on both ends.



The sheepshank: Often used to shorten a rope temporarily, the sheepshank is also valuable as a sling for ladders. To tie, form an "S" loop in the bight, as shown. Then with one free end of the rope, make a half hitch and slip it over

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one of the loops. Tighten, and repeat with the other loop. When used merely to shorten a rope and for greater security, both loops should be "stopped" (wound) to the standing parts.

Tackle Terms and Definitions

Bight—Any slack part of a rope between the two ends, particularly when curved or looped.

Block—A frame of wood or metal, within which are fitted sheaves or pulleys over which a rope may be led. The pull of the block is increased in direct ratio to the number of sheaves used. Blocks are designated as single, double, triple, etc., according to the number of sheaves in them.

End—or running part of the rope, is the free end which, when interwoven with the standing part or the end of another rope, forms a hitch or knot.

Fall—The free end and section of a rope to which the pull is applied in hoisting or moving a load.

Fall Block—The block in a fall and tackle to which pull is applied in hoisting or moving a load.

Lashing—A length of rope used to bind anything, or for fastening it to a fixed or more rigid object.

Movable Block—The block, in tackle, to which the load is attached.

Reeving—Process of passing the rope through a set of blocks in the proper way so as to prepare for use as tackle.

Right-Laid Rope—Rope in which the twist of strands is counter-clockwise. When held vertically, the strands of the rope spiral upwards to the right. The less common, left-laid rope has an opposite, clockwise twist and the strands spiral upwards to the left when held vertically.

Sling—A rope with ends spliced or knotted together, used in suspending or making fast a tackle around the object to be lifted.

Standing Part—The long inactive length of the rope.

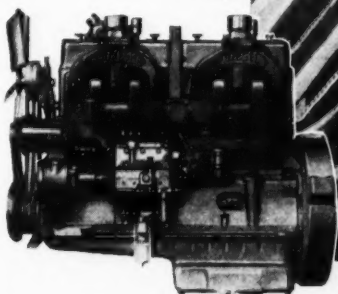
Tackle—Ropes and blocks combined for the purpose of multiplying the pull on an object. What is gained in pulling power, however, is lost in speed. For example, double blocks (four sheaves) increase the pull four times—but the hauling rope must move 4 ft to move the load 1 ft.

Whip—A tackle consisting of a single block and rope. Similar tackle with two blocks is a "double whip."

Quarries to Dams



P&H Model 955A Shovel in quarry of Massachusetts Broken Stone Co., Weston, Mass., has a 6-WAKD WAUKESHA DIESEL as does the P&H 995A Crane pouring cement on Mansfield Hollow Dam, Wilimantic, Conn. D.V. Frione & Co., New Haven, own the crane.



Model 6-WAKD Super-Duty DIESEL—six cylinders, 6¼-in. bore x 6½-in. stroke, 1197 cu. in. displacement.

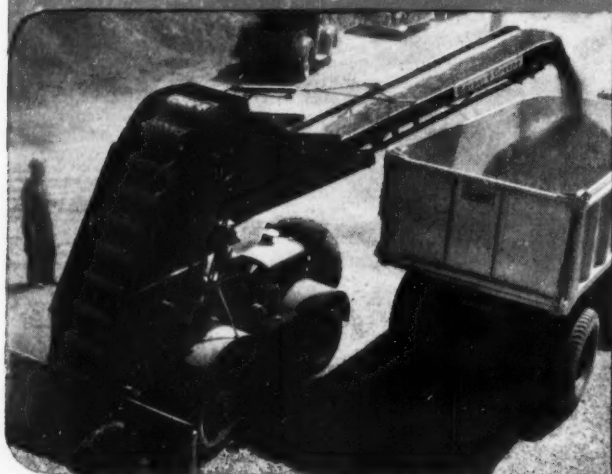
WAUKESHA Diesel POWER

● Trigger quick, but smooth and slick—the Waukesha Super-Duty Diesel snaps right into it, almost the same second the shovel operator puts on the power. It's that *fast recovery* that makes a Waukesha Diesel so different. And you can tell the difference, too—in loads per minute. Operators, contractor-owners, and shovel-makers agree on that. With Harnischfeger Corporation of Milwaukee, Wis., the Waukesha 6-WAKD Diesel is standard equipment on their P & H Model 955A 2½ to 3 cubic yard shovels, draglines, and cranes, that are so versatile on such a variety of construction jobs. Pictures show two of them at work.

Like all Waukesha Diesels, this Super-Duty Six has many exclusive design features. Most outstanding is the patented spherical combustion chamber. That's the *why* of Waukesha Diesels' unusual performance—the lively, responsive acceleration, smooth, shock-free operation, clean and complete combustion with high fuel economy and low maintenance. Get all the details—send for Bulletin 1415.

WAUKESHA MOTOR COMPANY, WAUKESHA, WISCONSIN
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BARBER-GREENE BUCKET LOADERS



No other machine, no other method can equal the speed and efficiency of Barber-Greene Bucket Loaders in loading sand, gravel, and other similar bulk materials from stock piles and storage areas into trucks. At rates up to 3 cubic yards per minute, these loaders dig, lift and convey bulk material in one continuous high capacity

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A TYPE THAT WILL DO YOUR JOB BEST

MODEL 543

This self-propelled loader is mounted on a tractor-type chassis and pneumatic tires for traveling from job to job at rates up to 15 m.p.h. Equipped with a hydraulic swivel conveyor, it has the reach to load highest trucks, long trucks and trailers, and trim the load to full capacity every time. Capacity—3 cubic yards per minute. Easily converted for loading coal or snow.



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MODEL 82A

This crawler-mounted, 3 cubic-yard per minute Bucket Loader has the stability so often necessary in typical truck loading operations—in pits, on soft or rocky ground, etc. Built for heavy, continuous operations, it is economical enough to justify itself in intermittent service. Complete accessories are available, including single and double deck vibrating screens for loading, screening and scalping simultaneously.



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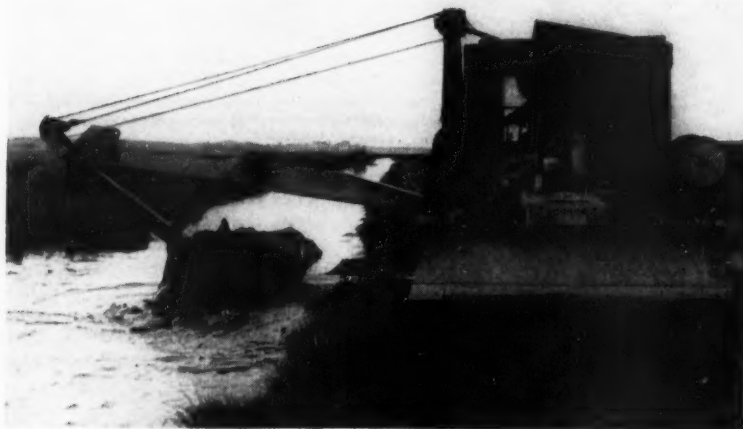
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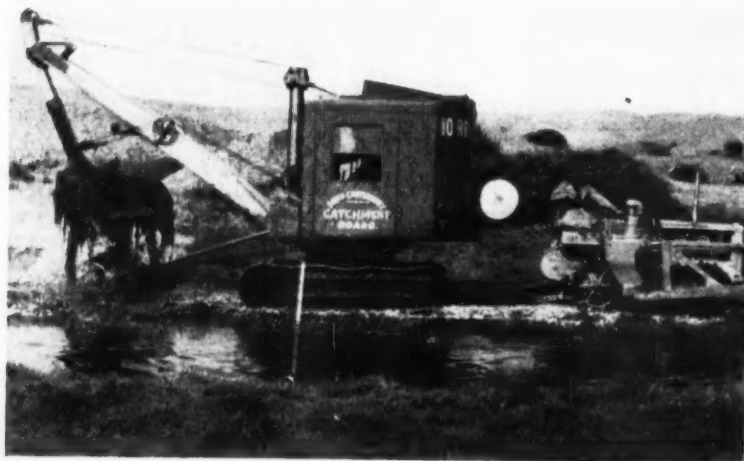
** SALES OFFICE



New Zealanders design a 10-ft bucket . . .



. . . to mount on a backhoe for ditch work . . .



. . . and it's towed along by a tractor

BECAUSE OF THE NATURE of the terrain, drain maintenance is almost a continuous operation in New Zealand and Australia. Hundreds of miles of irrigation ditches, roadside drains, water races and the like must be cleaned regularly and mechanization has lessened the job considerably. The latest bit of ingenuity was on the part of the South Canterbury Catchment Board in New Zealand whose engineers designed 10-ft long hinged buckets fastened firmly to backhoes.

Draglines had been used with 8-ft wide buckets. These removed weeds and silt but did not disturb rocks and shingle, because of the lack of control on a dragged bucket. By fastening the new models to backhoes, they were rigidly controlled. Once this system was working well, the same engineers became impatient with the slow rate of travel. An operator would have to stop and lock all boom action, then engage driving gears to move ahead for the next bite. At that spot the reverse was true: Travel gears were disconnected and the boom set into action once again. Simultaneous travel and boom swing is impossible on most machines. Where it is possible, it's impractical. The New Zealanders merely put the backhoe's travel gears in neutral, fastened it to a tractor with a rigid boom connection and, working as a team, the backhoe operator and tractor operator can now complete 6 mi of trench in an 8-hr day.

It's Automatic

The setup shown here consists of an R. B. 10 Rustom Bucyrus machine, drawn by a Caterpillar D-2 tractor. The backhoe is rated as a 33-hp, $\frac{3}{8}$ -yd machine, but the standard 2-ft, 3-in. bucket was replaced with the new 10-footer. The Board's chief engineer reports that the rig will clean drains all the way from 8-ft bottom width, 3-ft depth and 1:1 side batter to those with 3-ft bottom width, 6-ft depth and 1:1 side batter.

The 10-ft buckets are hinged at points 2½ ft from either end. They are so arranged that the trip lever is automatically released and the contents dropped when the bucket reaches emptying position. When the load is clear, the bucket automatically swings back and locks itself in digging position again.

Additional facilities, now on the design boards, are expected to ease the strain on operators and increase working speed by 20%.



Here's how ROCKMASTER® blasting increases explosives efficiency



You can see ROCKMASTER efficiency in these pictures, taken at the height of four different ROCKMASTER blasts. There is no flying rock, no geysering of explosive force. ROCKMASTER keeps the power of the blast confined, using all the explosives energy to produce maximum breakage with maximum efficiency.

When the blast is initiated at the point of maximum confinement, the explosive force follows the line of least resistance . . . directly into the burden. With ROCKMASTER millisecond blasting, the first initiation places the burden under maximum stress, producing lines of weakness

throughout the burden. A split-second later, the next charge hits the stressed material with a shattering force that produces maximum breakage . . . maximum use of the explosive force. It is the "one-two punch" applied to blasting.

Ask your Atlas technical representative to show you the picture presentation of the ROCKMASTER story. See for yourself how the millisecond delay electric blasting caps teamed with the ROCKMASTER system of explosives choice can give you greater blasting efficiency through complete confinement of the blast.



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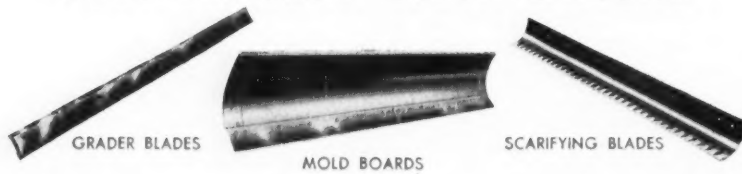
It's built tough to be tough.

Contractors like the Shunk blade for its superior quality and its ability to spread maintenance and construction costs, as well as its ability to spread aggregate and dirt.

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NEW CATALOG

Safety Saves Money At Project Blue Jay

THE SAFETY RECORD of the Thule Air Force Base (Project Blue Jay) in northern Greenland has saved the government at least \$830,000 in returned insurance premiums. So said S. Bruce Black, president of Liberty Mutual Insurance Co., in presenting a safety plaque to Peter Kiewit, head of North Atlantic Constructors (a combine of Peter Kiewit Sons' Co. and Condon-Cunningham Inc., Omaha; and S. J. Groves & Sons Co. and Al Johnson Construction Co., Minneapolis), who built the huge Arctic installation.

Despite the most adverse climatic conditions imaginable, Thule was finished with an accident-frequency record 75% better than the national construction average for the same type of work stateside. During the 1952 construction season, some 5,000 workers completed 8,600,000 man-hours, almost half in Arctic darkness, on the rush job.

Safety Records

Some typical safety records: Riggers raising sheet steel for fuel tanks in winds of gale velocity completed 60,687 manhours with only one lost-time accident, and it kept only one man off the job only one day. Drillers finished 23,316 man-hours without a single accident. A steel communications tower almost as high as the Empire State Building was erected in seven weeks with only one minor accident, although men were exposed to winds as high as 125 mph and sometimes could not see the ground because of clouds. About 100,000 tons of dynamite were exploded during base construction without serious accidents.

"This remarkable saving of life and property resulted from 100% cooperation and active interest on the part of the builders in the safety methods of the insurance loss-prevention engineers," Black said. "It proves that pre-planning can drastically reduce accident potentials, even under the worst weather conditions."

The Kiewit company's Jack Altig was project manager on the combine's Thule job. The Greenland project was under the supervision of the Northeast District, Corps of Engineers, for whom Col. Morton Solomon is district engineer.

Homocord Conveyor Belt—More use per dollar

Homocord Conveyor Belt—More use per dollar

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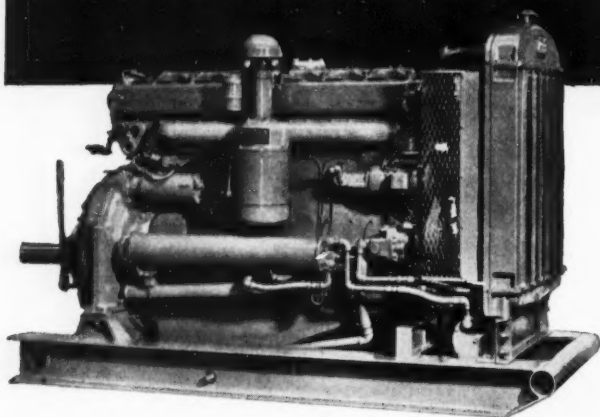
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more economy . . . smoother

operation . . . better response

because it has UNIT FUEL INJECTION



Murphy Diesel Generator Set, owned by Lehigh Construction Co., Inc., used to power a series of electric welders being used in steel construction.

The performance of a diesel engine can be no better than the accuracy of control of fuel injection. That's why we say the unit injector is the heart of the Murphy Diesel. This simple, self-contained unit is both pump and nozzle. There are no high pressure fuel lines to interfere with smooth, accurate, precisely controlled fuel injection and rob you of power and fuel. In the Murphy Diesel, solid fuel completely atomized as a fine fog is injected directly into all parts of a plain, open combustion chamber. Ignition is accomplished solely by the heat of compression of the air within the cylinder. The precisely controlled rate of injection determines the speed and pressure of combustion, hence the power delivered and the amount of fuel used.

Translated into benefits for the user, Murphy Unit Fuel Injection makes possible greater power output with less fuel—better all around performance. Full details are given in the booklet "10 Questions to Ask a Diesel Engine Salesman". Ask your Murphy Diesel Dealer for a copy or write direct.

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SOIL-CEMENT stabilized base for Hollywood Freeway is prepared by this neat traveling plant arrangement. Top 4 in. of 16-in. selected-material base is scarified and windrowed to receive stabilizing cement. Barber-Greene loader at left of equipment fleet loads

cement-enriched material into B-G traveling plant, when water is added, and moistened mix is deposited in front of Johnson spreader. Water for traveling plant is supplied by tractor-drawn tank, fed by water truck to rear.



LOADER had to be lowered to clear 15-ft overhead clearances under five bridges spanning freeway. Contractors and engineers be-

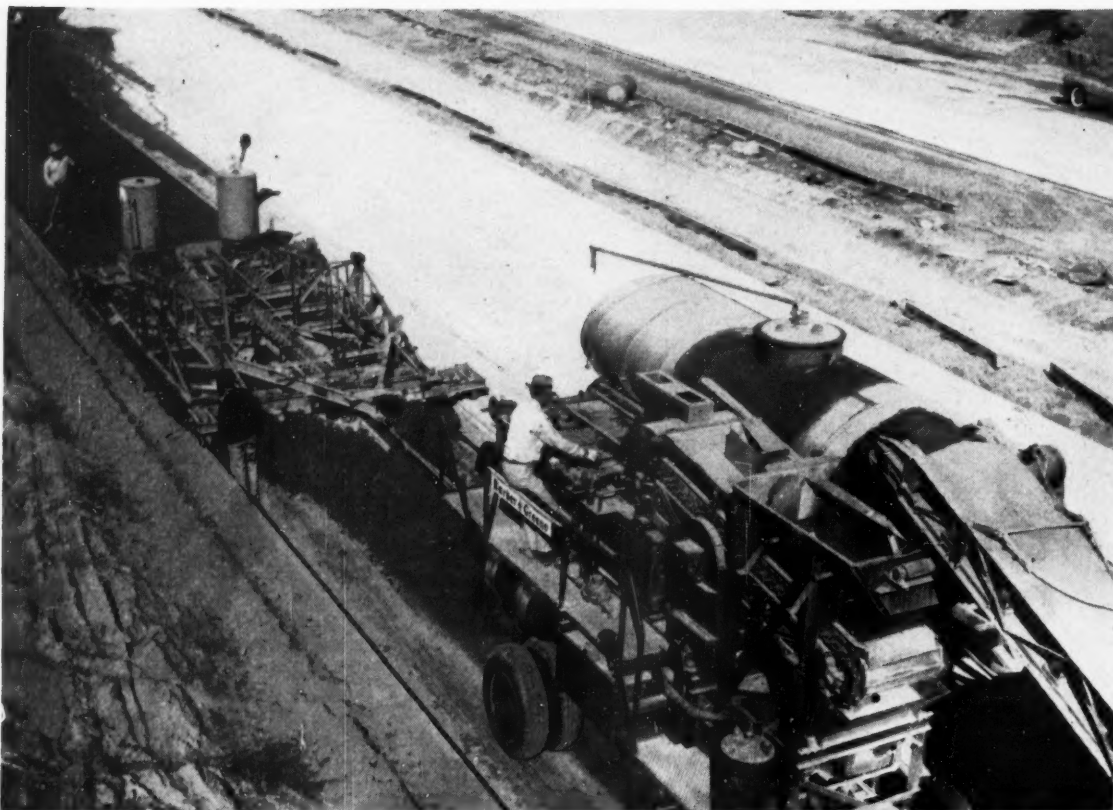
lieve shortened loader belt adds to mixing efficiency of equipment fleet. Travel speed of fleet is 18 fpm.

Traveling Asphalt Plant Mixes Soil-Cement Base

Photos and Information from Barber-Greene Co.

IN PAVING a three-quarter mile section of the Hollywood Freeway in Los Angeles for the California State Highway Department, Webb & White, Los Angeles contractors, adapted a Barber-Greene 848 Travel Plant for preparation of the cement-stabilized base.

The job involves eight 12-ft strips of 8-in. concrete paving in depressed sections, crossing under



TRAVELING PLANT discharges moistened soil-cement mix in front of rebuilt Johnson spreader, which transforms windrow of processed material into even layer across 12-ft strip ready for subsequent roller compaction.



HERE'S HOW the Johnson spreader leaves processed top layer of soil-cement stabilized base for compaction by rollers. Caterpillar grader with blade controlled by rubber tires riding concrete and forms, shapes the base to finished grade and contour.

five overhead bridges, divided into separated traffic ways of four lanes each. Adapting the equipment to pass under the limited overhead bridge clearances of 15 ft was one of the contractor's major problems.

The base consists of selected and graded materials compacted to 95% density to a depth of 16 in. Then steel forms are set, and the top 4 in. of each 12-ft lane is scarified and windrowed for mixing with cement.

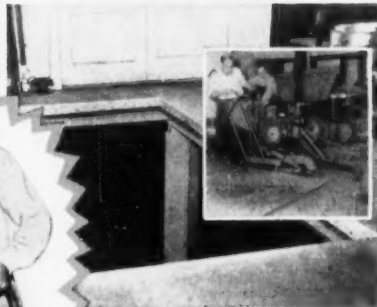
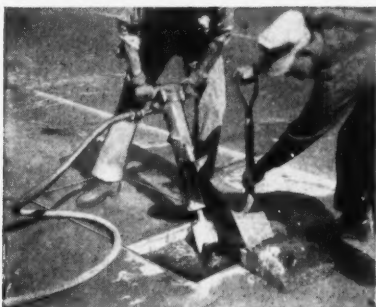
Base material weighs 130 lb per cu ft, to which is added portland cement, 2¾% by weight, spread over the windrow either by hand with bagged cement or by calibrated bulk cement feeder trucks. This material is then picked up by a Barber-Greene loader, transferred to the 848 Travel Plant where water is added to obtain 11% total moisture.

The travel plant discharges the moistened mix in a windrow, which is spread to 6-in. thickness by a Johnson longitudinal spreader. Travel plant and spreader are pulled by the loader.

The Barber-Greene 848 Travel
(Continued on page 156)



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WITH A
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CONSAW**



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—TRENCH and PATCH OPENINGS
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Save up to 50% in labor and material. Saw repair patches—water, gas, sewer and air line trenches in floors, streets, walks, runways and highways. Save, too, by sawing contraction joints—eliminate costly hand forming and spalling.

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C-130



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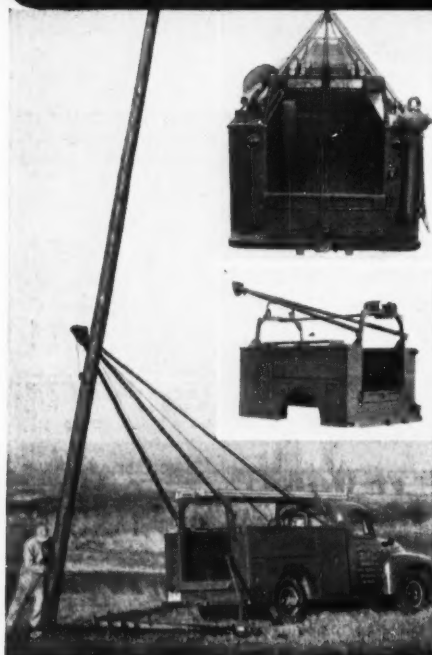
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ASPHALT PLANT . . .

Continued from page 154

Plant, furnished and altered by Brown-Bevis-Industrial Equipment Co. of Los Angeles, is designed to allow uninterrupted mixing under the low bridges. The B-G 82-A bucket loader, prime mover and advance unit of the equipment array, is lowered accordingly and fitted with a short belt conveyor to transfer the material to the apron feeder of the travel plant pugmill. These units are handling 14,000 tons of material on this one job.

Produce 248 tph

Travel speed of the fleet is 18 fpm, despite the fact that the loader tows both the travel plant and a Johnson float finisher rebuilt for spreading the soil-cement mix. Production is averaging 248 tons per hr. based on a 55-min-per-hr operation. Auxiliary equipment includes a 2,000-gal water truck, pulled by a wheel tractor, supplied by a feeder water truck.

Directly behind the Johnson spreader comes a Huber 12-ton tandem roller for first compaction. This is followed by a Caterpillar No. 12 motor grader, with blade extensions equipped with rubber-tired dollies riding on the forms and previously-placed pavement to shape the rolled material to finished section. Next comes a Buffalo-Springfield tandem roller converted to pneumatic tires for final compaction.

Cement Reduced

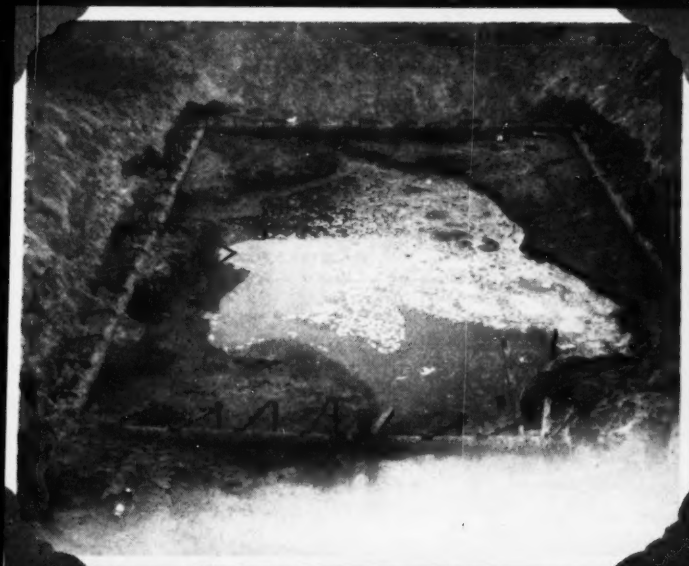
The result of all this is a stabilized top layer of the 16-in. base compacted to 49% density, 4% more than specified, with a tensile strength of material in place of 600-800 psi, where only 400 psi is required. Because of the super results, the cement content has now been reduced to 2 1/2 %, with a considerable saving in cost to the state.

This procedure produces an intimate and thorough mixing of soil, cement and water, resulting in higher compaction percentages and higher strengths of in-place materials. The short belt conveyor on the loader is providing additional mixing action.

Because the travel plant and spreader are towed by the loader as an integral assembly, the rollers

(Continued on page 160)

From the MORETRENCH ALBUM



of Success Stories

Project:

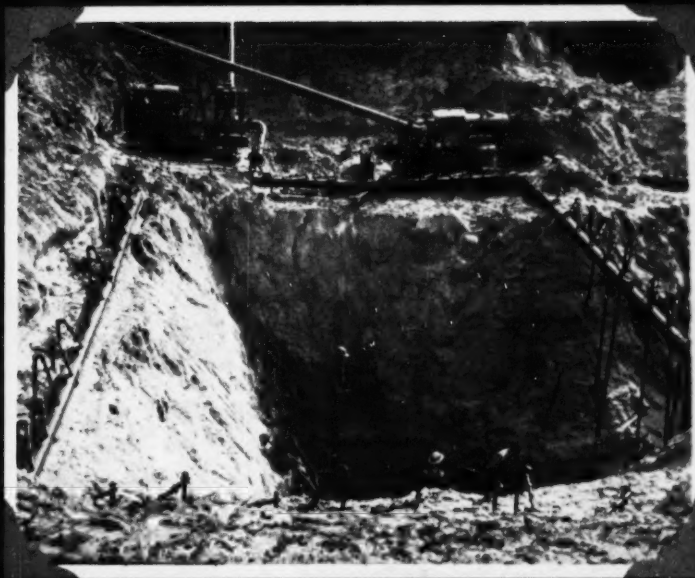
To replace a pipe line buried nearly 40 feet underground—Shreveport, Louisiana.

Conditions:

17 feet of water in quicksand.

Achievement:

Overnight a Moretrench Wellpoint System stabilized the soil. Excavation of 4,000 yards of sand proceeded "in the dry." Banks were sloped—bracing eliminated...in ten days time the job was finished!



This is just one of hundreds of case histories in the Moretrench Album. We'll be happy to show you others.

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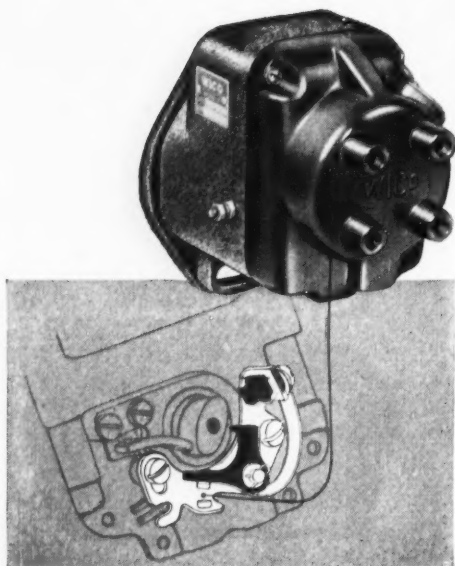
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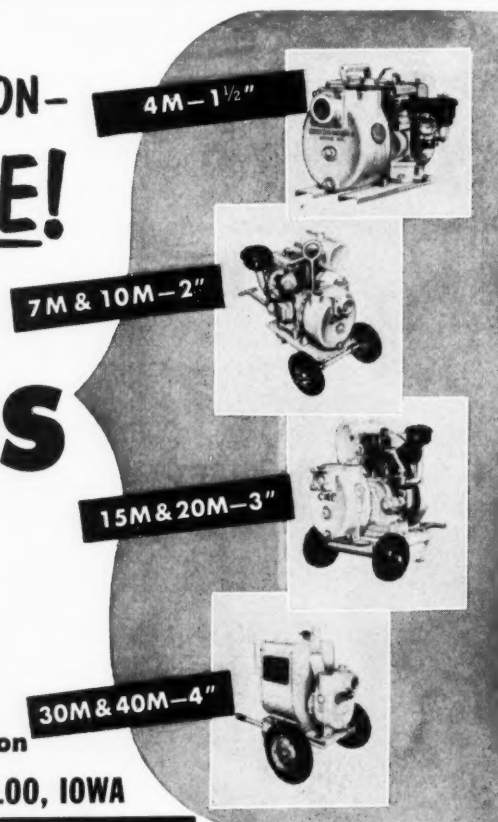
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DEPENDABLE LONG LIFE OPERATION—
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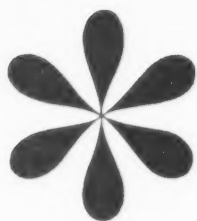
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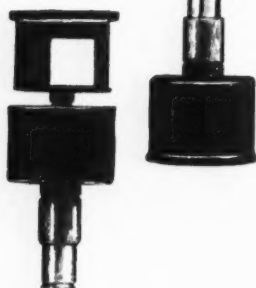
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ASPHALT PLANT . . . Continued from page 156

and grader can follow closely behind, working to full advantage in fresh material, with a time elapse of less than 30 min from picking up of windrow to completion of stabilized base. Then, too, at least 30 ft of clean subgrade is always open to inspection.

The design of the special pick-up of the bucket loader is such that all oversize rocks are kicked to one side, and not processed through the plant. When not busy with the travel plant, the bucket loader handles excess roadway material into trucks for disposal. The

travel plant will be utilized for preparation of soil-cement stabilized base under 4-in. asphaltic concrete for approach ramp paving.

James White is in charge of operations for Webb & White, and Ray Mason is job superintendent. Spencer Webb, of the contracting firm, has just been elected president of the Southern California Chapter, Associated General Contractors of America. R. A. Collins is resident engineer for the California State Highway Department.

The History of Construction

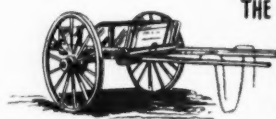
As It Was in the Beginning

Ancient Chariots Built the West



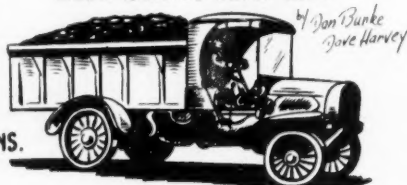
THE THOUSANDS OF MULE-POWERED CARTS THAT BUILT RAILROADS THROUGH THE WEST IN THE

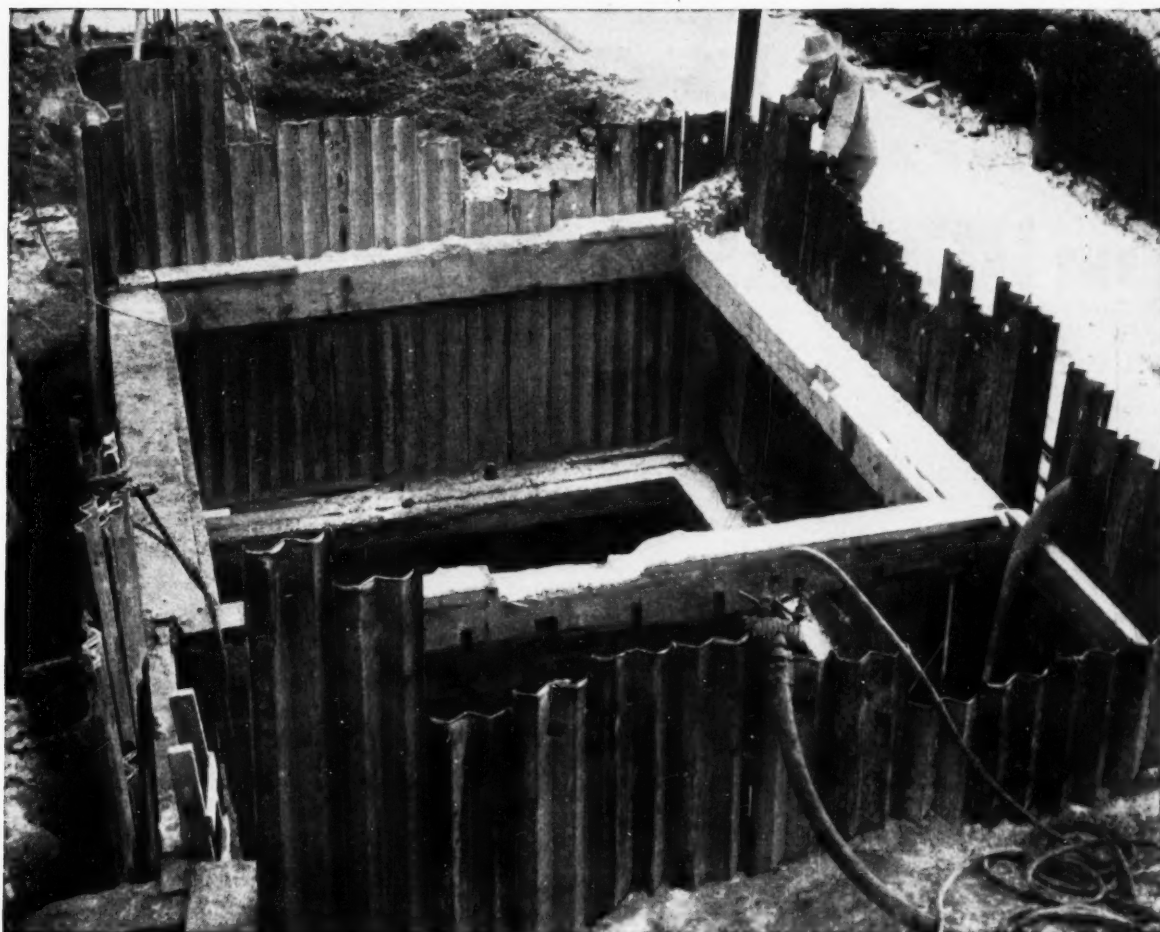
LAST CENTURY WERE THE TWIN BROTHER OF WHAT ONCE WERE TOOLS OF WAR.



THE DUMP CART WAS THE ONLY ADVANCEMENT IN DIRT CARRYING TOOLS IN THOUSANDS OF YEARS. CARTS USED IN THIS COUNTRY CARRIED ABOUT 24 CU. FT. AND WERE A BASIC DIRT MOVING TOOL. THE CART WAS A GRAVITY-DUMP RIG.

THE FIRST DUMP TRUCKS WERE BUILT IN THE EARLY 1900's. DUMPING WAS DONE BY A CHAIN HOIST, CAPACITY OF THESE TRUCKS WAS 5 or 6 TONS.





***Shore Jobs and Profits* WITH THIS SHEETING**

On close-figured jobs you will find Armco Steel Sheet Piling a great help. It saves time, money and labor; helps cut job costs.

Driving is easy. The smooth metal surface and small displacement area of Armco Sheet Piling mean less resistance. Even 20-foot lengths can generally be driven to full penetration before excavating. And they drive true with either power hammers or hand mauls.

You also cut costs because Armco Sheet Piling can be used over and over again. It is simple to pull and there is less danger of damage during driving. Safe, uniform strength is assured. And Armco Sheet Piling is light in weight and nestable so that hauling, handling and storage costs are low.

To meet specific job conditions you can select the type you need, either flange or interlocking, in a wide variety of gages.

You'll find Armco Steel Sheet Piling a valuable, cost-cutting tool. Use it for trenches, cofferdams, foundations and other temporary or permanent installations. Write for complete data. Armco Drainage & Metal Products, Inc., 3102 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. Export: The Armco International Corporation.



ARMCO STEEL SHEETING

ALONE IN ITS CLASS for TOP CAPACITY! THE UNIVERSAL 880 SENIOR "R"



BIG 1036 JAW CRUSHER

Famous Universal overhead eccentric force feed action and design for top capacity.

BIG 3022 ROLL CRUSHER

Roller bearing star gear drive. Designed to use its full 22" width for top capacity.

BIG 30" CONVEYORS

Top capacity loads handled easily.

BIG 4'x12' SCREEN

Full 48 square feet of screening area and inclined mounting for top capacity.

FIELD PROVED AND PORTABLE

Operators report tremendous capacities . . . fast and easy moves and setups. It's designed to meet state weight restrictions.

Before you buy get full details on the new, advanced design Senior "R" Gravelmaster. See your Universal distributor or write for literature.

UNIVERSAL ENGINEERING CORPORATION Subsidiary of **PETTIBONE MULLIKEN CORPORATION**

327 8th Street, Cedar Rapids, Iowa
Phone 7105

4700 West Division St., Chicago 51, Illinois
Phone Spaulding 2-9300



YOU'RE 5 YEARS AHEAD when you buy a Jaeger compressor

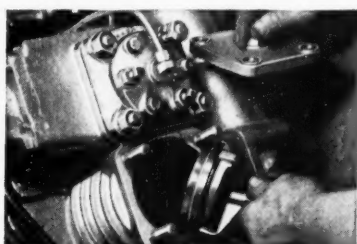
Some compressors are still being built to the old 1932 ratings which are too small for modern air tools.

Other models have recently appeared with the higher ratings needed today.

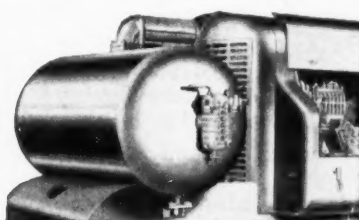
These higher ratings, which others now offer in "new models," are the ones Jaeger has been building for 5 to 7 years, and backs with proved performance of more than 30,000 "new standard" compressors in the field.

NEW:	75 cfm	125 cfm	185 cfm	250 cfm	365 cfm	600 cfm
OLD:	60	105	160	210	315	500

These 15% to 25% higher ratings insure 90 to 100 lbs. pressure at today's big tools, instead of 70 lbs., increasing their work output by 30% to 40%. No "old standard" machine can successfully compress, cool and deliver these larger air volumes. No new compressor has been built to deliver these volumes with the smooth, cool, long-life performance of the Jaeger Air-Plus.



75% to 100% larger valves for free flow without back-pressure.



Larger intercoolers, and air receivers. Relief valve for automatic drainage standard on all models.



Run these tools at 90-100 lbs. pressure

Model 75: 1 heavy breaker

Model 125: 2 heavy breakers or a 55 lb. sinker

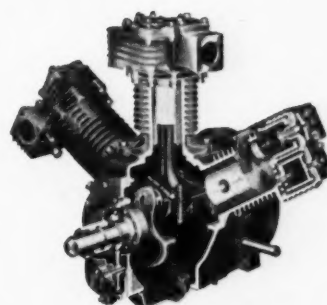
Model 185: 3 heavy breakers, 1 heavy rock drill, 2

medium rock drills, or one light wagon drill

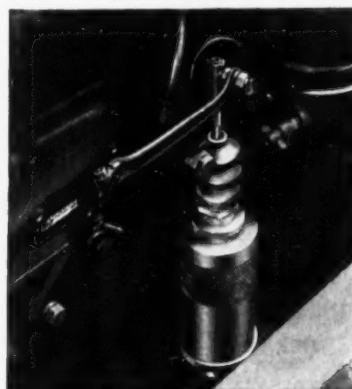
Model 250: 3 1/2" wagon drill or 2 heavy rock drills or a 10 hp Ka-Mo earth drill

Model 365: 4" wagon drill plus a plug-hole drill, or runs 15 hp Ka-Mo earth drill

Model 600: Two 4" wagon drills and hand held drill, or runs 9B-3 pile hammer.



Balanced W-type 2-stage compressor standard in all sizes, 75 - 600 ft. Cooler and smoother running than any V type.



Jaeger "Fuel Miser" standard on all models where automatic control of engine speeds means worthwhile fuel savings.

Lowest cost compressed air you can buy today

Prices of Jaeger "new standard" compressors are in every case below those being asked for old standard compressors of 15% to 25% less air capacity. On the basis of cost-per-cubic-foot-of-air-delivered, the difference is even greater, amounting to many dollars saving on every cubic foot of air capacity. On the basis of work output, the difference is greatest — amounting to 30% to 40% more production through more efficient operation of your air tools.

Why pay more and get far less when you can buy a proven Jaeger Air Plus Compressor.

For full facts about tools and their air requirements see your Jaeger distributor or ask for Catalog JC-1.

THE JAEGER MACHINE COMPANY

800 Dublin Ave., Columbus 16, Ohio

CONCRETE MIXERS • TRUCK MIXERS • PUMPS • PAVING MACHINERY



Biggest Producer IN THE ROCK PRODUCTS INDUSTRY

Athey
FORCE-FEED
HiLoader

FAST...

10 cubic yards picked up
and loaded per minute!

ECONOMICAL...

Simple one-man operation
... lower maintenance
costs — easy to service!

VERSATILE...

Unlimited application the
year 'round — this is no
"off-season" loader.

HERE ARE THE FEATURES YOU WANTED...

- ★ Exclusive full-floating
auger feeder
- ★ Faster clean-up
- ★ Adjustable discharge
height — loads from 10'
to 15' 7"
- ★ Big tires for top flotation
- ★ Road speeds to 20 mph
- ★ Quick moves from pile
to pile
- ★ Short wheelbase for easy
handling
- ★ Wide 96" pick-up
- ★ Hydraulic controls

Athey
FORCE-FEED
HiLoader

It's total yards loaded each day that
pays off... and the Athey Force-Feed
HiLoader is top producer in loading
out sand, gravel, crushed rock, cement,
minerals or any other loose-flowing
stockpiled or windrowed material.

The HiLoader digs in steadily,
gobbling up 10 yards per minute of
stockpiled or windrowed material.
Rugged construction insures uninter-
rupted work schedules. Trucks can
move in from any direction, for the
conveyor can be swung 45° right or
left, to load without stopping.

Why is the Athey HiLoader the
leader of all loaders? Because it is
field tested and proved... scores of
them are working across the country.
Your Athey-Caterpillar Dealer is ready
to prove to you that the Athey Hi-
Loader can out-produce any portable
loader conveyor... in material and
profits. Call on him for your demon-
stration or mail coupon for further facts.

ATHEY PRODUCTS CORPORATION
5631 West 65th Street Chicago 38, Illinois

YES, SEND ME HILOADER FACTS...

Please send descriptive literature on the new
Athey Force-Feed HiLoader, together with
name and address of my nearest Athey-Cater-
pillar Dealer.

CME-3

Name _____

Address _____

City _____ State _____

On-the-Job Contractor-Labor Relations

by LEON B. KROMER, JR.

Pay Controls Have Ended but...

DON'T THROW AWAY records of
wage and salary increases granted
during the two years controls were
in effect. Keep all letters of ap-
proval from the Wage and Salary
Stabilization Boards and decisions
of the Construction Industry Sta-
bilization Commission that support
increases you paid. Although the
Wage Stabilization Board has an-
nounced that it will retain only a
staff sufficient to finish all enforce-
ment cases under way, the Bureau
of Internal Revenue can go back
3 yrs in checking returns and could
impose disallowances of illegal
payments during the period con-
trols were in effect.

Here's what you can do now that
controls are off:

1. On and after Feb. 6, 1953 (the
decontrol date) you can increase
or decrease wages and salaries
without any approval.

2. Wage increases agreed upon
through collective bargaining and
for which approval had been re-
quested from CISC may be put into
effect in accordance with the agree-
ment.


3. Wage increases or fringe bene-
fits agreed upon may now be put
into effect even though the sta-
bilization agency had modified or
denied the adjustment. *Example:*
Co. A is a party to an agreement
with a building trades union pro-
viding for a welfare fund based
upon an employer contribution of
10¢ per hr effective July 1, 1952.
CISC modified this to 7½¢ per
hr. It is now permissible for Co. A
to go back and pay the 2½¢ dif-
ference from July 1, 1952.

4. If an agreement was reached be-
fore Feb. 6, 1953 providing for
wage increases but no petition had
been submitted to the stabilization
agency the agreed upon rates may
be paid in accordance with the
agreement.

Decontrol was good news for the
(Continued on page 167)

New Sinclair Grease for Heavy Duty Equipment

Tests prove New Grease and Longer gives Better Lubrication Life to Bearings!



A new Sinclair grease with superior lubricating qualities is now available for bearings of heavy duty construction equipment. Sinclair HEAVY DUTY BEARING GREASE is specially compounded to *stay put* in heavily loaded, slow speed rotating or sliding bearings.

New Sinclair HEAVY DUTY BEARING GREASE has an exceptionally high load-carrying capacity . . . greater resistance to pounding and shock loads . . . greater resistance to melting out. Operators of power shovels, draglines, conveyors and all other heavy duty equipment are assured of longer bearing life . . . higher productivity. . . lower operating costs.

Sinclair HEAVY DUTY BEARING GREASE is available in three grades — "0," "1," and "2." It is easily applied with a hand gun or air gun. It comes in 35 pound pails and 100 and 400 pound drums.

A Sinclair Lubrication Engineer can give you expert counsel on how you can get the most out of Sinclair's new HEAVY DUTY BEARING GREASE. Phone your local Sinclair Representative or write to Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.

**SINCLAIR HEAVY DUTY
BEARING GREASE**

from every angle

Low Over-all Height
Rugged Construction
Yet Light in Weight

REX MIXERS



Shimmy Skip.
Flexible Chain
Drum Drive

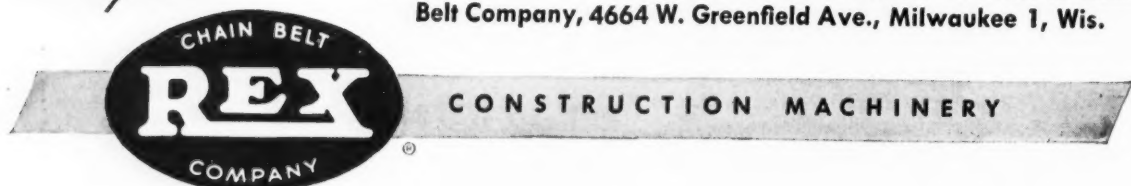
Grouped Easy Arc
Controls. Full
Accessibility of All
Mechanism

Anti-friction Bearing
Equipped Drum Rollers,
Countershaft, and
Hoist Drum

**GIVE YOU MORE PRODUCTION • LOWER COSTS
BIGGER PROFITS**

Low Center of Gravity.
Easy, Fast Spotting

Get all the details from your local Rex Distributor or write to Chain
Belt Company, 4664 W. Greenfield Ave., Milwaukee 1, Wis.



construction industry according to spokesmen for both the contractors and building trades unions. It was felt that now contractors and unions will have to bargain realistically in the light of economic conditions in their area.

More Brawn for the National Joint Board

To strengthen the National Joint Board for Settlement of Jurisdictional Disputes (CM&E June 1952, p. 120) the Executive Council of the Building Trades Department proposes a reorganization of the Board's membership. This is a result of action taken by the Council at its recent meeting in Miami.

The plan provides for four regular members and four alternates. A member would be disqualified if his union or company is involved in a jurisdictional dispute before the Board. An alternate would take his place. The Associated General Contractors and the specialty contractors must approve the plan before it can be formally adopted.

Building Trades Department officials won't comment, but it is known that they hope this action will mean the return of the International Brotherhood of Electrical Workers to participation in the Board's procedures.

Enforcement of the Wage-Hour Law

Recheck your payrolls and pay practices for compliance with the Wage-Hour Law (CM&E Mar. 1952, p. 98) to be sure you are paying covered employees at least the 75¢ per hr minimum wage and at least time and one-half their basic hourly rate for all hours worked in excess of forty in a regular week. A recent report issued by the Department of Labor Wage and Hour and Public Contracts Divisions states that contractors paid, for failure to comply, more than \$480,000 in back wage payments to almost 7,000 employees during 1952. This excludes payments contractors may have been required to make as a result of court action taken by employees. These payments can also include double damages.

If you aren't sure about an employee's coverage under the Act you can:

(Continued on next page)



Our plans didn't cover bungling...or a leaky roof!

(A true story based on Company Files #185B4921 and #185B5145)

We're consulting engineers. So, since drawings and tracings are the foundation of our business, their loss or damage could cost us a great deal.

Recently, we faced that fact twice within three months.

First, a client requested that we deliver a set of drawings before we had a chance to run off blueprints. While they were in his office, a "green" clerk all but ruined one drawing. In drafting time alone it was worth \$800.00.

The second loss *might* have been costly, too. A drawing and tracing for a bridge job were ruined by a leak in the roof of an engineer's shack.

Fortunately we carried a Records Destruction Policy in the Hartford Accident and Indemnity Company which paid the entire cost of replacing *both* of these drawings.

In your own contracting operations, you *know* how frequently blueprints, engineering plans, drawings and tracings are exposed to damage or loss.

You know, too, that you'll have to replace them if they're destroyed.

But have you ever considered how much that can cost you? Even a series of small losses can add up to important money...one large one can run into thousands of dollars.

That's why it is virtually a *business*

necessity for contractors to have Records Damage Insurance that will provide the money to restore or replace plans, blueprints, etc.—your own, or those that have been entrusted to you.

The cost of this specialized insurance is moderate, the protection it provides is great. Ask your Hartford Accident and Indemnity Agent or your insurance broker for full details. Or write us for a copy of Bulletin 76059.



Year in and year out you'll do well with the

Hartford

Hartford Fire Insurance Company • Hartford Accident and Indemnity Company
Hartford Live Stock Insurance Company • Hartford 15, Connecticut

LABOR ... Continued

1. Ask for information from the nearest Regional Office of the Wage and Hours and Public Contracts Divisions. (Offices are located in most major cities.)

2. Take no risks and set up the employee's salary so that you comply with the law. (Put the employee on an hourly rate and pay time and one-half for more than 40 hr worked in a week.)

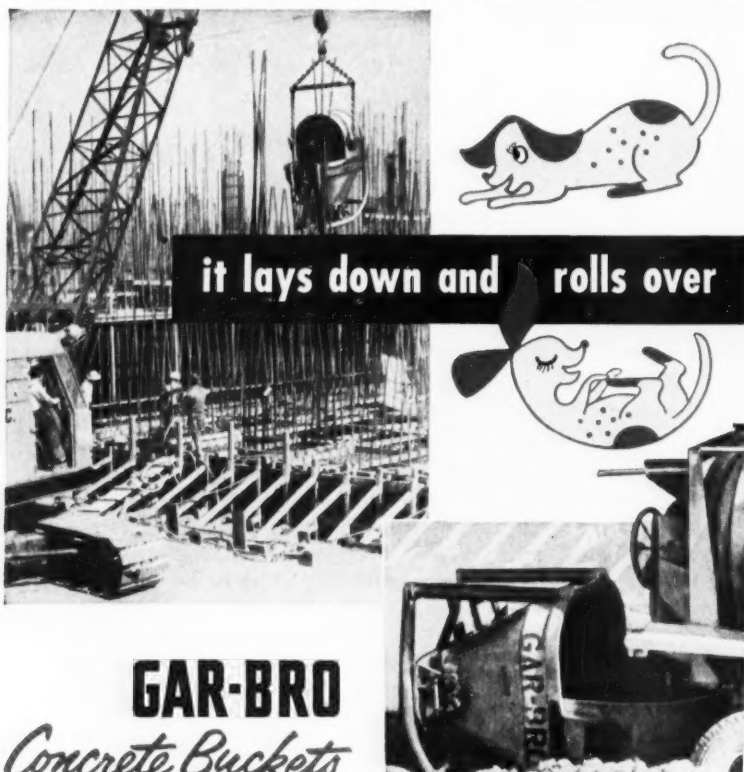
3. Ask your lawyer. It pays off to avoid violations. Enough back-wage payments can make a good job turn sour!

Do You Know That...

...the teamsters have just moved their international headquarters to Washington? This was announced by Dave Beck, president of the union, who indicated that temporary offices will be in the new AFofL Letter Carriers Building at 1st and Indiana Avenue, N. W.

...Representative Sam McConnell of Pennsylvania is the new chairman of the House Labor Committee? He will take a leading role in any proposed revisions of Taft-Hartley.

...the Department of Labor's Bureau of Labor Statistics will continue to publish the "old series" consumers price index until June 30, 1953? Many wage contracts provide for changes in wage rates based on this index. Be sure that any agreements now being negotiated to run after June of this year don't contain such a provision. The "new series" can be used as it's now being published and is considered the Bureau's official cost-of-living index.



it lays down and rolls over

GAR-BRO
Concrete Buckets

SPECIALLY DESIGNED FOR direct handling of concrete from truck mixers the Gar-Bro Laydown Bucket automatically rolls to a horizontal position when landed on the ground so even a low-discharge mixer truck can dump into it.

When lifted it automatically rocks up to a vertical position. Has patented, self-closing, double clamshell gate.

Laydown Buckets are available in four sizes 1 to 3 yd. capacities. There are 30 models of Gar-Bro Buckets ranging in capacity from 9 cu. ft. to 8 cu. yds. for handling every type of concrete. *Get the facts; write for information today.*



GAR-BRO MANUFACTURING COMPANY
2415 EAST WASHINGTON BLVD., LOS ANGELES 21, CALIF.

for faster concrete handling



Efficiency With Composite Piling

In preparing the foundation for an addition to the engineering building of the Boeing Airplane Co., Seattle, Mason Construction & Engineering Co., also of Seattle, drove untreated timber piling to the excavated ground line.

Then a 7- to 9-ft length of 12-gage, 12-in. Armco Spiral Welded pipe was set on top of the wood pile—which had a diameter of about 14 in. The mandrel inserted into the casing had a collar welded to it 4 in. short of the length of the casing. When driving began, the casing was driven 4 in. into the wood, sealing the joint.

Driving was continued to the required depth, as deep as 40 ft, and concrete poured into the casing. Composite piling was specified because ground water level comes within 10 ft of the surface, and long lengths of creosoted piling were not in sufficient supply. The job required 1,000 piles, each designed to carry 25 tons.

FROM THE
BIGGEST
TO THE
SMALLEST

...WITH LOTS OF
CHOICE BETWEEN

Whether you have to reach out 82 feet and handle 5-ton trusses ... or dig a small resident basement ... you can take advantage of high-speed, rubber-tire mobility in the capacity you need ... IF you make your selection from the Lorain line. From the giant 45-ton Moto-Crane to the new 6-ton "TL-10" Truck-Crane, you will find the right capacity Lorain to best fit your digging, lifting, loading and erection jobs.

Thew-Lorain pioneered the rubber-tire crane industry in 1919. Today, Lorain is the world's largest builder ... with more years of know-how ... more manufacturing experience ... and more selection. Those are the things you would expect the leader in the rubber-tire crane field to offer.

From the biggest to the smallest ... whether Moto-Crane, Truck-Crane or Self-Propelled ... you have more selection on rubber in the Lorain line. Ask your Thew-Lorain Distributor to give you all the facts.

45
TONS

30
TONS

20
TONS

15
TONS

10
TONS

6
TONS



6
TONS

LORAINS on RUBBER

45
TONS



82 ft.

45-Ton MC-824 — World's Largest Crane on Rubber

Above — Here's big-time crane operation on a job that a Lorain could fill best. This Lorain Moto-Crane, Model MC-824, is the largest rubber-tire machine that Thew-Lorain—or ANYONE ELSE—builds. Here, the MC-824 demonstrates its ability and capacity by using a 100-ft. boom plus a 25-ft. tip extension to reach out to an 82-ft. radius to set 5-ton trusses for a new school building.

6-Ton "TL-10" Truck-Crane — For Mounting on Your Truck

Left — This Lorain Truck-Crane, Model "TL-10", is shown mounted on a modified Autocar "4x4" chassis. It is the newest and smallest machine built by Thew-Lorain. The new "TL-10" turntable is available for field mounting on your new or used truck. In this small machine, Thew-Lorain has incorporated all of the famous Lorain quality and design features normally found in larger types. You get low first cost plus high operating efficiency in the "TL-10".

THERE'S MORE
SELECTION
IN THE
NAME

THEW
LORAIN

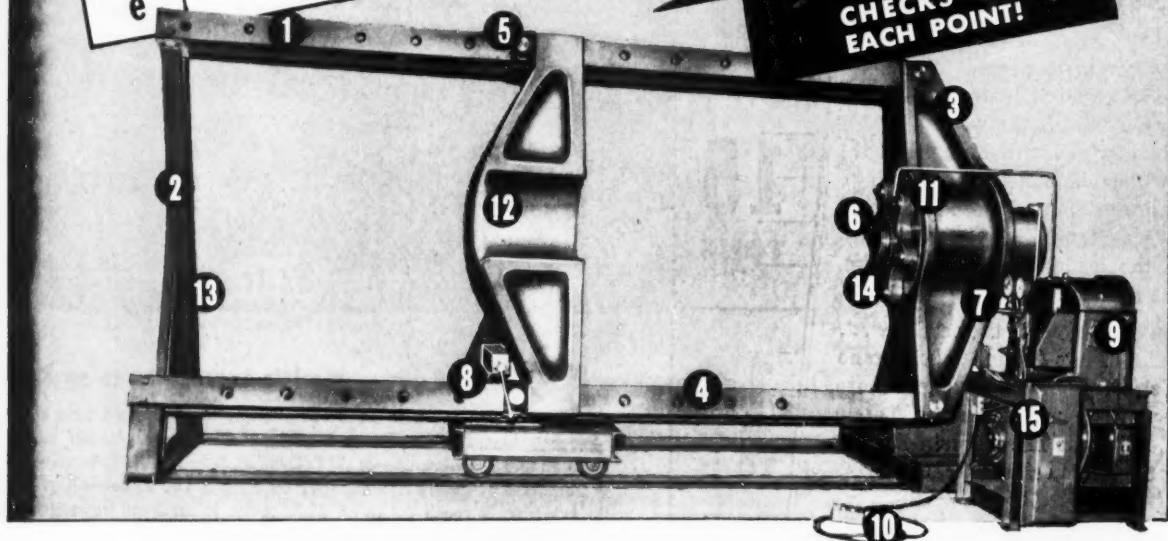
THE THEW SHOVEL CO., LORAIN, OHIO

when you choose a **FORCING PRESS**...

**YOU WANT
THESE
QUALITIES**

a	RUGGED, LONG-LIFE CONSTRUCTION	✓	1 Cold rolled steel tension members.
b	SIMPLICITY AND SPEED OF OPERATION	✓	2 Rigid support frame—solidly welded.
c	ACCURATE POSITIVE PRESSURE CONTROL	✓	3 Head and abutment members of finest alloy cast steel—heat treated.
d	FLEXIBILITY TO PERFORM A VARIETY OF JOBS	✓	4 Accurately machined bearing block pin holes.
e	EASY MAINTENANCE AND SERVICING	✓	5 Free moving bearing blocks firmly positioned by a single steel pin.
			6 Spring return or double acting rams.
			7 Working pressure always visible with remote control.
			8 Hand winch moves abutment truck smoothly for quick positioning.
			9 Selective, positive pressure adjustment control.
			10 Remote control assures greater accuracy.
			11 Press Cylinder removable as a unit for special jacking or pulling operations.
			12 Nested yoke adaptors available in various sizes for any model press.
			13 Open end design provides ample clearance for long material.
			14 Extra long ram travels available.
			15 Separate pump and cylinder units simplify press assembly—allow quick inspection and servicing.

**HERE'S HOW
RODGERS
CHECKS ON
EACH POINT!**



You'll find all these features and more on every Rodgers Forcing Press you compare, whether you choose the 600 ton Press shown here, or any of the other models ranging from 100 tons to 600 tons. They are available with either hand pumps or a selection of power driven pumps. On models up to 200 tons, 13 inch spring return

cylinders are standard. On models 200 tons or more, 26 inch double acting cylinders are standard but longer ram travels up to 48 inches are available. You'll find complete details in the new Rodgers Forcing Press Catalog. Write for your copy today—and then compare!



Rodgers Hydraulic, Inc.

7403 Walker St., St. Louis Park, Minneapolis 16, Minn. **HYDRAULIC POWER EQUIPMENT**

Remember These...

THE MEMPHIS CHAPTER, Associated General Contractors of America, regularly publishes its "AGC News" for the membership. A recent issue was devoted to construction safety. Here are some mighty sensible and workable safety tips for every job.

MATERIAL HANDLING:

Lift with legs instead of your back. Avoid overstrain; get help if necessary.

Pile materials so they cannot topple over.

Do not dislodge materials when taking supplies from piles, trucks or freight cars.

When nail kegs are opened, remove nails used to hold covers.

Do not throw materials from heights unless roped off or a watchman posted.

Protruding nails should be removed promptly.

When forms are wrecked, keep lumber in piles until it can be cleaned and processed for re-use.

Make sure runways have smooth surfaces and are wide enough to allow free movement of wheel barrows and concrete buggies.

Carefully select drivers to operate gasoline-powered concrete buggies. Speed of these vehicles should be regulated by job conditions.

ELECTRICAL HAZARDS:

Post danger signs around high-voltage lines or transformers. Banks of transformers should be fenced off.

Protect electric light bulbs with wire guards.

Only qualified electricians should make electrical repairs or do any new wiring.

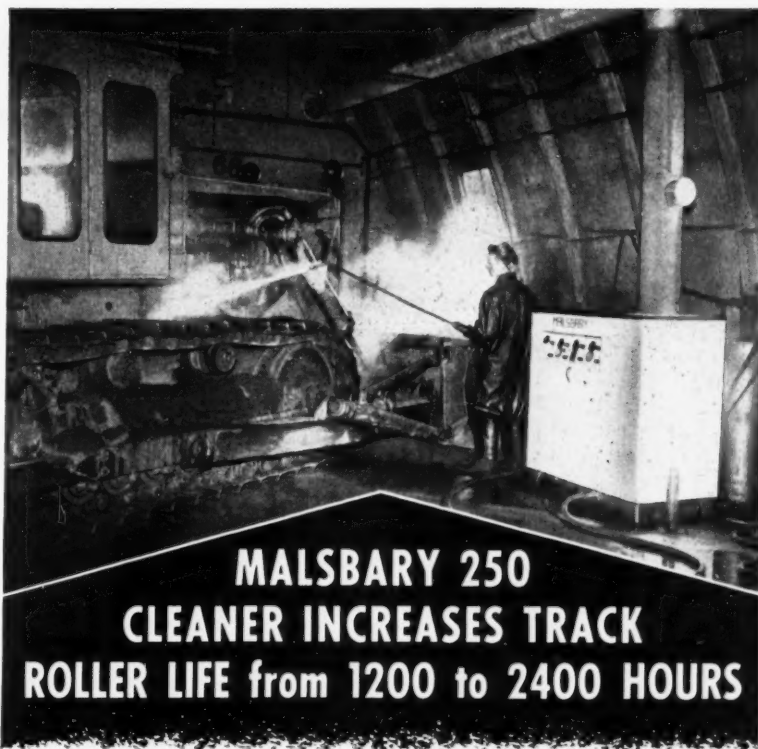
All motors and portable electric tools should be properly grounded.

Rubber mats should be provided in front of panel boards.

Use approved type fuse pullers when changing fuses.

Use rubber gloves for high voltage work and test them regularly.

Any safety equipment which is used on high voltage work (hot sticks, rubber blankets, sleeves, safety belts, etc.) should be well cared for, kept dry and tested regularly.



MALS BARY 250 CLEANER INCREASES TRACK ROLLER LIFE from 1200 to 2400 HOURS

Abrasive grease, iron ore and mud cut track roller life to 1200 hours on Mesabi Range operations. Steam vapor cleaners were so slow that preventive cleaning was considered impractical. Then a MALS BARY 250 heavy-duty cleaner took over. Its extremely fast action completely cleans a D8 and dozer in 2 hours, makes it practical to steam clean "crawlers" every 24 hours of service, just before greasing . . . lengthens track roller life to 2400 hours or more! Today more than 15 MALS BARY 250's are cleaning tractors, trucks, drills, etc., on the Mesabi Range.

Try this Quick, Effective MALS BARY Way

Exclusive Patented Pumping System on MALS BARY heavy-duty models delivers 2 to 4 times more pressure than steam vapor cleaners . . . and at temperatures to 325°F. . . so you can quickly loosen and blast away abrasive, corrosive mud, grease and stubborn road oils from construction rigs; de-gas, heat and clean asphalt tanks; do many jobs other cleaners can't touch. See for yourself—fill in coupon NOW for on-job demonstration.

3 heavy-duty models—250, 300 and 500. Oil or gas fired; gas engine or electric drive; stationary, portable or trailer mount. All develop hot solution in 2 to 3 mins. No gadgets; dependable.



Room C-3, 845 92nd Ave., Oakland 3, Calif.

Malsbary Mfg. Co., Room C3, 845 92nd Ave., Oakland 3, Calif.

I AM INTERESTED IN —

- ☐ On-the-job demonstration.
- ☐ Free booklets on MALS BARY Cleaners.
- ☐ "How To Make Efficient Use of Steam Cleaning" reprint.

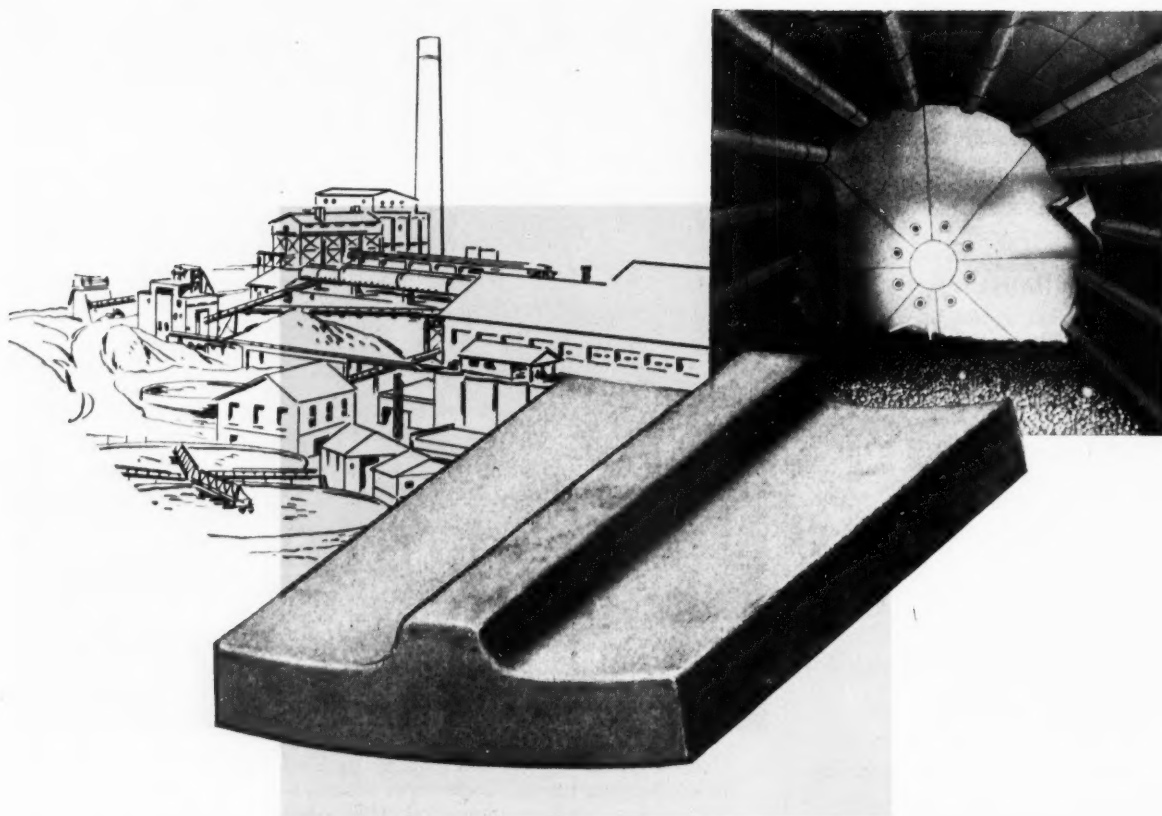
NAME _____

POSITION _____

BUSINESS _____

ADDRESS _____

**MAIL
TODAY!**



this LINER boosted production 35%

AMSCO Ball Mill Liners

Reduced Down-Time, Increased Production...

A large West Coast cement producer found that Ball Mill Liners were causing expensive trouble. Liners were thick—over 3 inches. This meant reduction in mill capacity. Thick liners also meant tremendous weight. Both thickness and weight reduced production and efficiency. *Liners wore rapidly*, too, causing frequent, expensive replacement jobs, with costly labor and material. And added to the bill was lost production due to mill down-time.

Well-known for their skill in handling impact and abrasion-resistant alloys, AMSCO engineers and foundrymen were consulted.

AMSCO solved the Ball Mill Liner problem.

AMSCO designed a new, light, thin—1 inch thick—liner, which because of lightness and thinness increased mill capacity, heightened efficiency. The new liners lasted beyond all expectations and in addition the segments were easier to install. These factors, plus reduced replacement down-time, have been responsible for a 35% increase in production.

AMSCO is the largest producer of Manganese Steel, "the toughest steel known," which has proven itself under countless abrasion and impact situations. And where the service conditions require it, AMSCO also produces Chromium-Molybdenum and Chrome-Manganese alloys.

If you have a tough wear problem and suspect that there may be a better alloy for your purpose, you are invited to write to AMSCO for further information.

AMERICAN

Brake Shoe

COMPANY

AMERICAN MANGANESE STEEL DIVISION

385 EAST 14th STREET • CHICAGO HEIGHTS, ILL.

Foundries at Chicago Heights, Ill.; New Castle, Del.; Denver, Colo.; St. Louis, Mo.; Los Angeles, Calif.

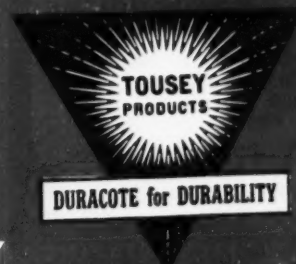
Offices in principal cities. In Canada: Joliette Steel Limited, Joliette, Quebec.

Protection by

TOUSEY!



TOUSEY finishes protect this heavy duty road scraper against many forms of abuse—repeated impact from rock and gravel, heat, water, weather and constant vibration. This particular machine is coated with a brilliant red—durable in color as well as surface—offering another form of protection, that of product identification.



THE TOUSEY VARNISH COMPANY

520 WEST 25TH STREET • CHICAGO 16, ILLINOIS

you can't **CONSOLIDATE**
THIS CHEAPLY unless
you can **CONSOLIDATE**
THIS FAST!

VIBRO-PLUS ROLLGEAR* internal vibrator

No other vibrator consolidates concrete as fast as Vibro-Plus because only Vibro-Plus has the patented Rollgear head — stepping up shaft speed to 11,000 to 15,000 VPM. This exclusive design eliminates gears, belts and clutches — minimizes wear, reduces down-time, cuts operating costs. That's why only Vibro-Plus is so fully satisfactory in performance. Write for illustrated bulletin and name of nearest distributor.



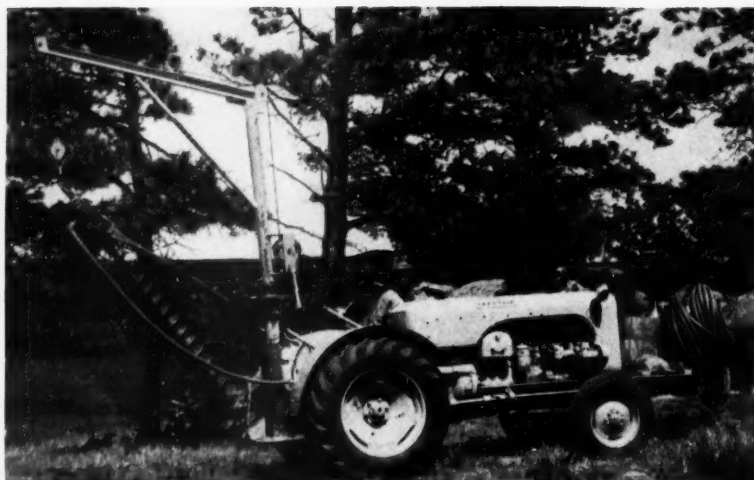
TYPE ERSB,
electrically operated.
Fully enclosed. Swivel
or skid base. 20 or 30 ft.
flexible shaft with snap
coupling. Shaft can be
lubricated in 15 seconds
(even while running).
Head needs no
lubrication ever.
Interchangeable for
gasoline or pneumatic
drive. 1 1/4" — 2 3/16" — 2 3/4" —
4" heads. Grinding
attachments available.

OUR ENGINEERING DEPT.
will recommend, design and
build special equipment for
any special purpose.

*Reg. U. S. Pat. Off.

VIBRO-PLUS
PRODUCTS, INC.

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WORLD PIONEERS IN APPLIED VIBRATION



All-Purpose Fence Builder

UNION PACIFIC RAILROAD ENGINEERS couldn't find an automatic fence builder to install 85 mi of tight line fencing along their new low-grade bypass west of Cheyenne, but they came close to it with this versatile rig. It is a LeRoi 105 Tractair compressor and tractor combination, with a Ka-Mo 6-in. auger hanging from a jinny-wink crane at rear of tractor. The auger is powered by an Ingersoll-Rand Multi-Vane air motor.

Air tools include rock drills, a pneumatic rock splitter and plenty of hose. A hand post-hole digger is also carried along. Thus, the fence gang, consisting of Indians from a near-by reservation, can dig holes in any ground they encounter.

The UPRR is building the fences with its own forces under the direction of W. R. Tyler of the bridge department. Grading and culvert installation for the new line were described in CM&E, Sept. '52, p 48.



SPIKE SEZ: Hey! Better come back and lock that tool box before one of those inquisitive little inspectors gets into a serious jam. Better yet, let's escort them carefully off the job site.

practical pointers...

on choosing the right instruments for your job

Now you can choose from *two different lines* of Berger Instruments, the type that best fits your day-to-day surveying needs—from the simplest home and road building to the most exacting first-order surveying projects. For now, Berger makes both moderate-priced Builders and Contractors Instruments and its world-famous Engineers'

Transits, Levels, Alidades, Theodolites and Astronomical Instruments.

Whatever your surveying need, there's a Berger to do it Better—like those illustrated here.

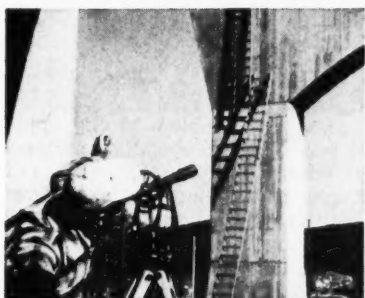
You may have descriptive literature on these and all other Berger Instruments, on request. Write today.



For Roads ... Home Building ... and similar construction ...

laying out and measuring horizontal and vertical angles, leveling, measuring differences in elevation, setting building lines and batter boards, lining up engine beds, plumbing walls and columns, use the sturdily built, moderately priced Berger Convertible Transit-Level. 12-inch erecting-internal focusing hard bronze telescope. Rack and pinion adjustment. 22 power coated optics. Steel spindle. Horizontal and vertical vernier readings to 5 min. Dust-protected axis bearings, leveling, tangent and clamp screws. Mahogany transit case.

Write for details of Berger 12" Dumpy Level and Builders' and Farmers' Service Transit-Level.



For Exacting Assignments ... Highways, Dams, Bridges ...

the Berger Engineers' Transit. Horizontal circle has double opposite verniers reading to minutes, 30 seconds or 20 seconds; verniers are offset to line of sight and provided with reflectors. Protected vertical circle has double vernier. Graduations on Sterling Silver. Erecting-internal focusing telescope. Smooth-acting leveling and tangent screws; level vials readily visible. Large bearing areas on centers and clamps. "R" type equipped with compass, yoke standard and wye bearings.

Write for "Accuracy in Action" describing other Berger Transits; Dumpy, Wye, and Precise Levels; Up-and-Down-sighting Vertical Collimators; Jig Collimators; Alidades; Mining and Astronomical Instruments.



For Contractor's Field Office—Complete Drafting Kit ...

New Berger Drafting Kit combines all necessary drafting instruments and supplies in one easy-to-carry case. It includes your choice of complete 14-piece professional type drawing set or master bow pencil or interchangeable bow with ruling pen—all in velvet-lined case—plus protractor, architect's scale, engineer's scale, 8" and 10" triangles, French curve, draftsman's tape, pencils, pencil pointers and erasers. Inner compartments hold drawing and note papers—all in attractive, durable, 16" x 24" simulated leather zippered carrying case of scuffproof, waterproof Texon—with slide-in type handles.

Ideal for field or office use—and at home, too. Issue it, get it back intact. No lost or strayed equipment. Write for prices.

C. L. BERGER & SONS, INC., 37 WILLIAMS STREET, BOSTON 19, MASS.

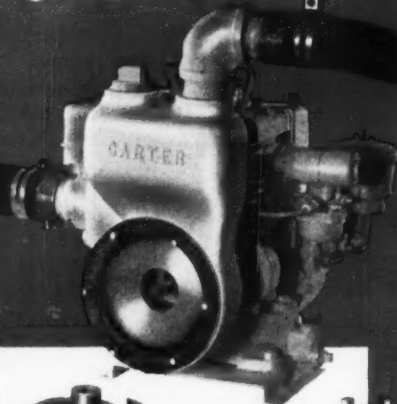
Engineers' Transits
Builders' Instruments
Levels
Alidades
Theodolites

THE BEST IN  IS

BERGER
ENGINEERING AND SURVEYING INSTRUMENTS ... SINCE 1871

Here's the New HUMDINGER

**SIMPLEST,
MOST
PRACTICAL**
Self-Priming
Centrifugal
Ever Built



ONLY TWO BASIC PARTS . . . the impeller and the seal, that's all you'll find inside the new Humdinger. Here's an advanced new pump design that eliminates all non-essential, non-pumping parts . . . resulting in the greatest possible simplicity of action and a remarkably efficient pump performance.

A NEW PRINCIPLE OF IMPELLER ADJUSTMENT . . . maintains peak efficiency for the entire life of the pump *without shims, wear plates, or replacement parts of any kind.* This simple adjustment completely compensates for impeller wear quickly and easily . . . without removing impeller, without disconnecting suction or discharge hoses, without dismantling the pump.

A NEW IDEA IN VOLUTE DESIGN . . . Twin-Coaxial Volute Passages, an exclusive Carter development, completely eliminates mechanical valves and priming devices. Here's a lighter more compact pump case that offers greater capacity, more trash handling ability, and the fastest most foolproof priming action ever developed.

Here's a Self-priming Centrifugal that's years ahead. The Humdinger is *really new* . . . completely different . . . engineered to give Contractors the finest pumping equipment available.

COMPLETE RANGE OF SIZES

FREE BULLETIN #5300

*fully describes the entire line
of new HUMDINGERS*

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RALPH B. CARTER CO.

202 Atlantic St., Hackensack, N. J.



PERFORATED corrugated drainage pipe, 48 in. in diameter, is lowered vertically into a deep hole to drain street run-off water.

Perforated Pipe Sumps Handle Water Drainage

SURFACE DRAINAGE of a street intersection in El Segundo, Calif., had been a problem to city engineers. Topographical conditions ruled against natural run-off, and there is no underground storm drainage at that spot. This spelled recurring floods during rains.

The situation was explained to Armco Drainage and Metal Products, Inc., while seeking a solution that would take care of the water—without going into an extensive drainage program. Armco engineers recommended that a hole be dug on each side of the street and 48-in. perforated corrugated metal pipe be sunk to the depth necessary to provide good drainage.

The holes were dug to a depth of 20 ft. Then a 35-ft section of pipe was lowered into the hole, and excavating continued until the pipe was down its full length.

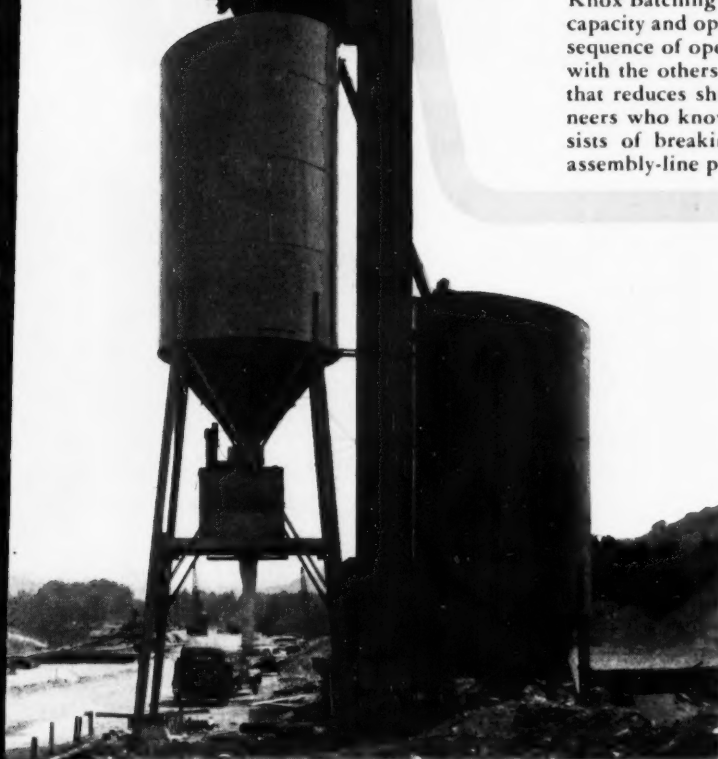
A conventional curb inlet was built with a 12-in. corrugated pipe lead-in to the sump. A cast-iron ring and manhole cover permit cleaning. Several heavy rains since the installation have put the pipe sumps to the test, and they are doing the job so well that officials of the near-by city of Long Beach have heard about it and ordered six similar sumps, 45 ft long.

**ELIMINATE
BATCHING BOTTLENECKS**

TEAM-UP

BLAW-KNOX BATCHING PLANTS

WHEN you team-up Blaw-Knox aggregate and cement batching plants, your project marches, instead of marking time. Blaw-Knox Batching Plants are engineered to match each other in size, capacity and operation. They assure the most efficient, *time-saving* sequence of operations, without overtaxing one plant to keep up with the others. They're integrated for the balanced production that reduces shutdowns and delays. They're designed by engineers who know construction intimately, and whose work consists of breaking bottlenecks to keep *your* job moving with assembly-line precision.



**MECHANIZE
EVERY STEP!**

Use the BLAW-KNOX
"Complete Package"
for every concrete paving job

100% mechanization of your paving set-up is the answer to today's high-speed paving operations. The Blaw-Knox "Complete Package" contains every piece of equipment you need for assembly-line operation . . . from Clamshell Buckets, Batching Plants and Forms to Subgraders, Pavers, Spreaders and Finishers. Your "Complete Package" is a one-source team of money-making equipment, backed by one undivided responsibility, and with one distributor source for prompt, expert parts and maintenance service on all your package equipment. Call your Blaw-Knox distributor today.

BLAW-KNOX BULK CEMENT PLANTS

The Model BCPC 400-B Portable Bulk Cement Plant illustrated above has 400-bbl. storage over the electrically interlocked Weighing Batcher, and 400-bbl. ground storage over the conveyor screw. Bins are interchangeable and the tank portion is one-piece welded construction with symmetrical base plates. The round bin design assures the utmost portability and speed of erection. Available with 200-bbl. or 400-bbl. bins and in combinations which double these capacities.

BLAW-KNOX AGGREGATE BATCHING PLANTS

The Blaw-Knox 100-ton 3-compartment Portable Aggregate Plant shown above is equipped with a 1¼-yd. Automatic Weighing Batcher for loading batch trucks. Filling gates are opened in sequence by a single electric motor which is intermittently energized by simple automatic control in the dial stand. Portable Batching Plants are available in 2, 3 and 4-compartment styles and in capacities ranging from 100 to 120 tons. Aggregate Weighing Batcher, both conventional and twin types, are included.

BLAW-KNOX

**BLAW-KNOX
EQUIPMENT DIVISION
OF BLAW-KNOX CO.**

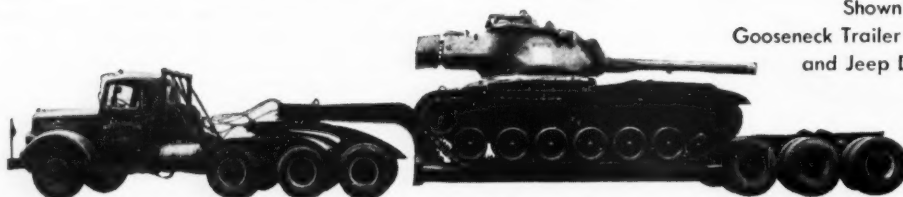
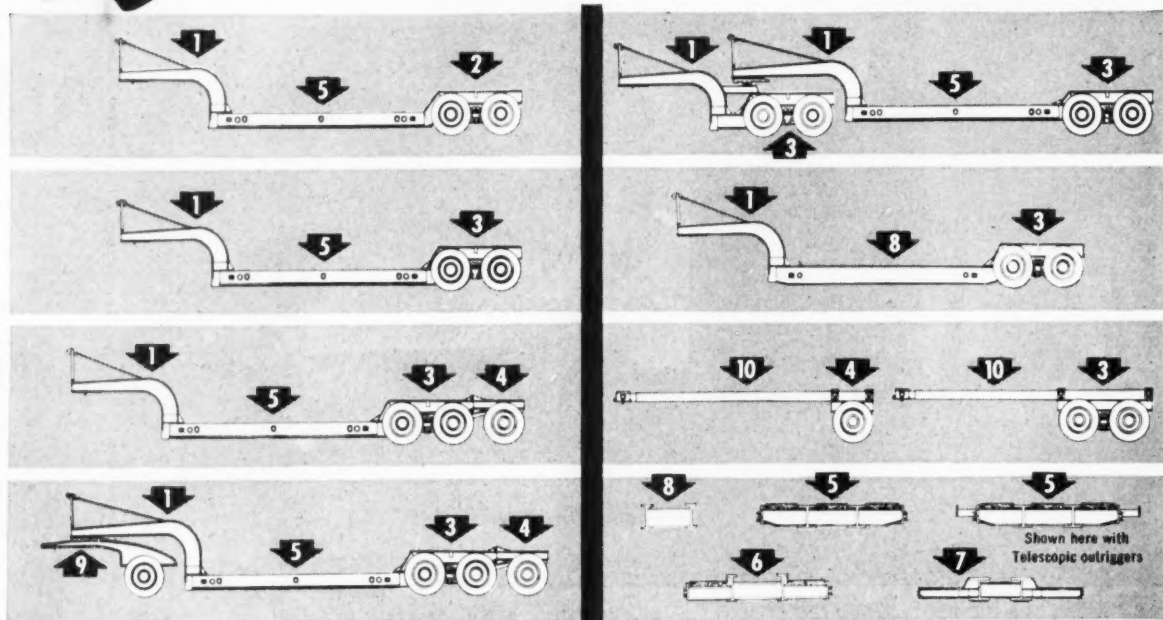
Farmers Bank Building
PITTSBURGH 22, PA.
Offices in Principal Cities



Simple Conversion

the TALBERT way

Talbert Trailer component parts permit simple conversion for varied or specialized hauling problems.



Shown Here: Talbert Removable Gooseneck Trailer with Removable 3rd axle and Jeep Dolly with 6 wheel tractor.

- | | |
|-------------------------|---------------------------------|
| ① Removable gooseneck | ⑥ Raised-center deck |
| ② Fixed rear axles | ⑦ Drop-side deck |
| ③ Removable rear axles | ⑧ Beam deck |
| ④ Removable third axles | ⑨ Single axle dolly |
| ⑤ Standard deck (flat) | ⑩ Extendable pole trailer reach |

THESE FEATURES ARE AVAILABLE FOR TALBERT TRAILERS IN EVERY CAPACITY



THE TALBERT CONSTRUCTION EQUIPMENT CO., of Lyons, Illinois manufactures a complete line of low-bed trailers and dump semi-trailers

THE TALBERT-WAY IS THE EASY WAY

For additional details write for new Talbert general catalog No. 104

PROSPERITY IN THE USA: How Deeply in Debt Are We?

How prosperous *are* the people of the United States? Previous messages in this special series have answered this question in part by recording the progress—relatively slow progress—we have made in increasing both the income and the wealth per person in the USA.

This fourth and concluding piece of the special series deals with the extent to which our prosperity should be discounted because it has been accompanied by an increasing volume of debt. Many correspondents have suggested to us that an individual or a nation can temporarily increase prosperity by borrowing, but in so doing lives on both borrowed goods and borrowed time. Our purpose here is solely to throw light on the question of whether or not we are now in that unenviable position.

On January 1, 1953, the total debt of the United States government and of its citizens was \$627 billion, as shown in the table below. On its face, a debt of this magnitude, which represents about \$3,900 of debt for each person, suggests that we are heavily debt-ridden.

TOTAL DEBT — PUBLIC AND PRIVATE

Federal government debt.....	\$267 billion
State and local debt.....	30 "
Private debt	
Corporations	195 "
Individuals	135 "
	\$627 billion

The burden of our debts, however, does not depend simply on their size. It depends in much more decisive degree on our capacity to carry the load successfully. This capacity, in turn, is partly a matter of attitude, and attitudes defy objective measurement. A community that gets very jittery about its debts has less capacity to carry its burden successfully than one that does not. But the accurate measurement of jitters, present or prospective, still remains to be mastered.

Capacity to Carry the Debt Load

Nonetheless, it is possible to throw some light on our capacity to carry the debt burden by studying key economic elements that can be measured with some degree of accuracy. The following paragraphs indicate how some of these key economic elements stand.

Compared with our national income, the total volume of our debts, public and private, is still well below the level of 1929, when it proved to be too big for the good of the country. Our total debt is now 113% greater than the national income whereas in 1929 it was 146% greater.

There are several other cheering facts about our debts. One is a sharp decline in interest rates which makes the cost of carrying our debts relatively much less than it was in 1929. It took 8% of our total national income to carry our debts in 1929; it takes only about 5% of the income today.

(Continued on next page)

More Cheering Facts

We also have much more ready cash now than in 1929. Today individuals and corporations hold a total of \$269 billion in cash or its equivalent which is almost twice as much as the portion of private short-term debt (about \$140 billion) that is subject to sudden demand for payment.

Many students of the subject cite the relatively low cost of carrying our debts and the large volume of cash on hand, and reach the comfortable conclusion that our debt burden is nothing to worry about. In further support of this view they emphasize the fact that no important part of our debt is owed abroad. Hence, they reason there is not the danger, so conspicuous in Britain since the end of World War II, that our economy will be upset by the necessity of making heavy debt payments to other countries.

Some Dangers of Present Debt

However, the nature of our debts presents dangers that it would be foolish to ignore. This is true of both the debt of \$267 billion owed by the federal government to its citizens and the \$330 billion in private debts owed by some citizens and corporations to others.

Public debt can be a dangerous kind of debt because government has the power to print money or to create its equivalent by expanding bank credit. Of the \$215 billion that the federal government borrowed during World War II, over \$90 billion was borrowed from banks. This was the largest single contributor to the inflation of prices that since the war has robbed the dollar of about half of its purchasing power, and thereby robbed the buyers of government bonds of about half the purchasing power these bonds were supposed to represent.

If, as is quite possible, a new emergency should again require the federal government to borrow heavily while its debt remains so high, it is doubtful that the public would be averse to buy its bonds. Hence, the government might again be forced to resort to the inflationary process of relying on bank credit.

Private debts can be dangerous if the people

take on new debts more rapidly than is justified by the growth of business or by their ability to repay. Last year bank loans were increased by the imposing sum of about \$6½ billion, which represents an increase of about 11% in total loans outstanding. This is almost twice as much as the increase in the volume of business over the same period. Installment credit for consumers increased by \$3 billion last year, again an increase in debt about twice as great as the increase in business volume in the fields where the credit was used. It is also the fastest rate of such growth in our history.

Constructive Use of Credit

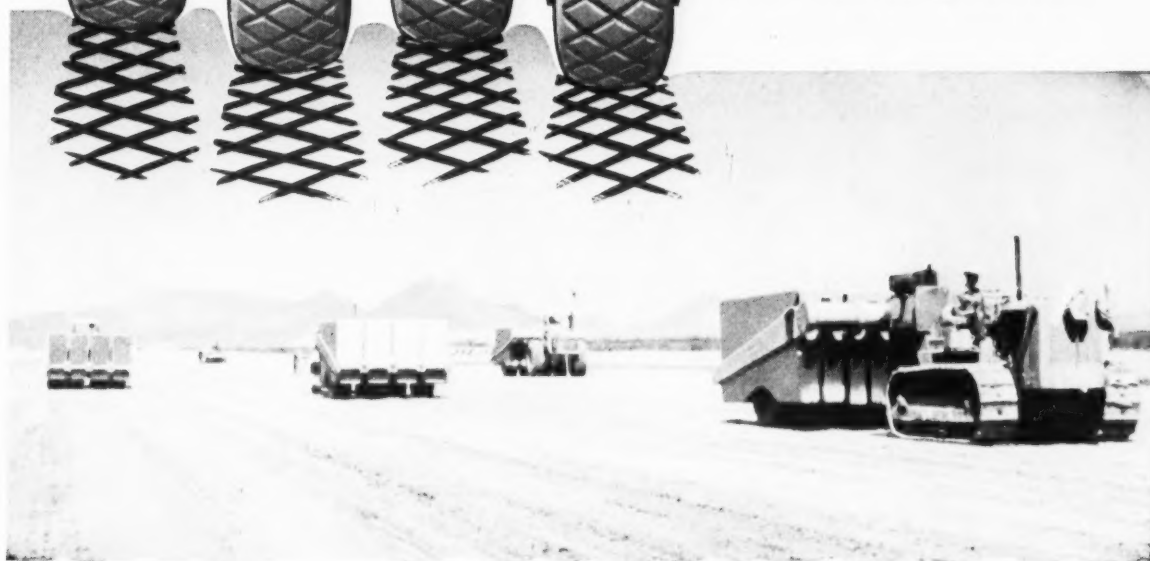
So long as the expansion of credit does no more than keep pace with expansion in the volume of business, the expansion is constructive. Also, when credit is expanded to acquire resources and equipment that will enlarge the volume of business a little later, that use is clearly constructive. But when private credit expansion begins to run ahead of business growth, it is time for us to be heads up. Such credit expansion courts price inflation. It also creates a forced draft under business so that, if credit is cut off, there may be a painful drop.

To give a summary answer to the question: *Is the level of debt in the United States a danger to our prosperity?* — the answer seems to be, "Not at the moment." We owe nothing abroad. The interest burden on present debt is relatively small, and we appear to have the resources to handle the short-term debt. Yet both the total amount of debt and the recent rapid increase in total private debt, especially the latter, are enough to signal for caution. We need restraint on the part of business and consumers to avoid expanding private borrowing at an excessive rate. The federal debt needs to be reduced and put in more manageable form. If these things are done, we can proceed to build a sound prosperity.

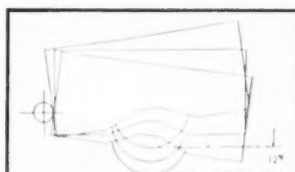
McGraw-Hill Publishing Company, Inc.

compact heavier lifts

with fewer passes



Southwest COMPACTION ROLLER



Greater Oscillation

Each wheel of the Southwest Compaction Roller is mounted in an independent weight-box unit. Hinge point of wheel is at extreme rear of its own weight-box. Closely spaced wheels give maximum compaction with as much as 12" variance in height. Offers oscillating freedom and greater compaction on uneven ground.

ON THE BIG JOBS use the Southwest Compaction Roller to keep pace with speedy, 24-hour job schedules and bigger earthmoving equipment. It compacts heavier lifts with fewer passes. Weight-box units oscillate up and down independently to provide a constant compaction weight on each tire regardless of ground contours. There is no bridging, no shifting of load.

The Southwest Roller has flexibility to suit varying job requirements. Weight-boxes may be filled with wet or dry sand, earth, scrap or other materials. Sectionalized hauling yoke permits use of any combination from 3 to 6 weight-box units. Sizes and capacities range from 10 to 200 tons, suitable for light, medium or heavy duty compacting of earth.

Type Soil	Symbol	No of Single Passes	% Moist	FIELD		OPTIMUM			
				Dry Density Lbs. Ft. 3		% Moist Pass = 4	Dry Density Lbs. Ft. 3 Pass = 4	Ratio Den.—Opt Pass = 4	
				Passes = 4					
				Actual	Corrected				
Silty Sand	SM	6	7.3	128.0		8.0	133.6	96.0	
Sandy Clay	CL	6	10.2	110.0		15.3	116.2	95.5	
Sandy Clay	CL	6	14.3	114.0		15.3	116.2	98.0	
Sandy Silt	ML	6	14.6	115.0		14.2	120.8	92.0	
Clayey Sand	SC	6	9.2	125.2		10.2	128.3	97.8	
Silt	ML	6	6.6	119.0		9.5	125.0	95.0	
D.G	SW	6	8.7	126.7		9.2	132.0	96.0	
D.G.	SW	6	5.2	129.0		7.8	135.0	96.0	
Straight Clay	CL	6	6.3	122.8		10.3	127.1	96.6	
Pit Run	GW	6	4.8	133.5	126.5	7.7	134.5	95.0	

The above data on unit weight of soil samples has been taken from average compacted fills placed in lifts from six to twelve inches as specified. The unit weight per pneumatic wheel load being 25,000 lbs.

WRITE TODAY for illustrated folder which gives complete data and specifications.



CONSTRUCTION MACHINERY DIVISION

Southwest Welding & Manufacturing Co.

Alhambra, California

HAULING SCOOPS BULLDOZERS LOADERS BOTTOM DUMP WAGONS RIPPERS TAMPERS SCRAPERS TREE DOZERS

MADESCO

Heavy Duty Blocks

**PROTECT YOUR WIRE
ROPE INVESTMENT**



Longer life for your wire rope can be secured with Madesco sheaves properly machined for the size of rope used. Madesco sheaves and blocks equipped with anti-friction bearings and bronze bushings combined with quality workmanship assure smooth performance.

Special blocks for special needs made to order. A copy of our catalog is yours on request.



Over a quarter century of service

SALES AND ★ SERVICE ★

News of manufacturers' activities designed to assist the reader in the purchase of machinery, equipment and materials and help him obtain quick service on parts and maintenance.

Distributor Appointments

Bucyrus-Erie Co.: Cleveland Bros. Equipment Co., Route 322, Harrisburg, with branches in Wilkes-Barre and Frackville, Pa., has been appointed distributor of Bucyrus-Erie 3/8- to 4-yd gasoline, diesel and single-motor electric, general purpose convertible excavators in east central Pennsylvania. The distributor also will handle the truck-mounted Hydrocrane and Hydrohoe, as well as Red Arch dragline buckets.

Independent Pneumatic Tool Co.: Thor Contractor Tools will be distributed exclusively in Georgia by R. S. Armstrong & Bros. Co., Atlanta.

Pennsylvania Crusher Co.: Has appointed The Mine and Smelter Supply Co., 1422 17th St., Denver 17, Colo., and 1515 11th St., El Paso, Tex., as representative in New Mexico, Arizona, western Texas, Colorado, western Kansas, Nebraska and South Dakota, and eastern Wyoming and Montana. The Alliger and Sears Co., 2203 Fannin St., Houston, Tex., will represent Pennsylvania Crusher in central and eastern Texas and southern Louisiana; Tampa Armature Works, Inc., 401 S. Morgan St., Tampa 1, Fla., in Florida and southern Georgia.

The Warner & Swasey Co.: Announces the appointment of five distributors for the Gradall Earthmover. Leonard Motor Co., Albuquerque, will handle sales and service of the multi-purpose unit throughout New Mexico; Huggard Equipment Co., Winnipeg, will handle the Province of Manitoba; J. D. Evans Co., Rapid City and Sioux Falls, S. D., will cover South Dakota; Rocky Mountain Machinery Co., Salt Lake City, will handle Utah and bordering counties in Idaho and Wyoming; C. B. Stilwell Equipment, Inc., Omaha, will cover Nebraska and western Iowa.

On the Sales Front

Certain-teed Products Corp.: Creation of a new Technical Sales Division has been announced. The new division will handle sales of the company's products used by industry or in heavy and commercial construction and will be headed by Carl E. Berzelius. Eastern regional sales manager is William A. Whittier; (Continued on page 184)

dewater the Complete way

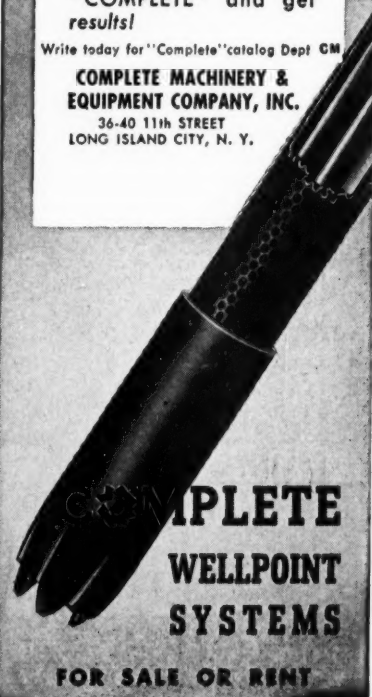


"Complete's" patented wellpoints give you compactness, simplicity, lightness and Strength. Keep wet work bone dry when other methods fail. Write or wire for estimates, and engineering consultation. Don't Gamble with costly water hazards . . . get "COMPLETE" and get results!

Write today for "Complete" catalog Dept. CM

**COMPLETE MACHINERY &
EQUIPMENT COMPANY, INC.**

36-40 11th STREET
LONG ISLAND CITY, N. Y.





The **HOIST** is
the heart of
the job

Your tower is a mighty important part of any building job . . . but how much is it worth until the hoist puts some pull on the line, and materials begin to move?

Carpenters need a steady flow of lumber for forms. Concrete has to move as fast as it's called for. All along the line, you can save minutes that are worth *big money* if you have speed, accuracy and dependability in the hoist.

Well-organized jobs all over the world are kept on schedule by American Hoists. A typical example is the Georgian Apartments, shown above, where a 3-drum American Model 75 handled the loads with power and speed to spare.

Would you like that kind of safety at the heart of your job? Let your distributor help you select your new hoist from the broad and world-famous American line.

3104

Modernize...economize...with
American Hoist

AMERICAN HOIST & DERRICK CO. • ST. PAUL 1, MINN.

For safety...insist on

American

CROSBY

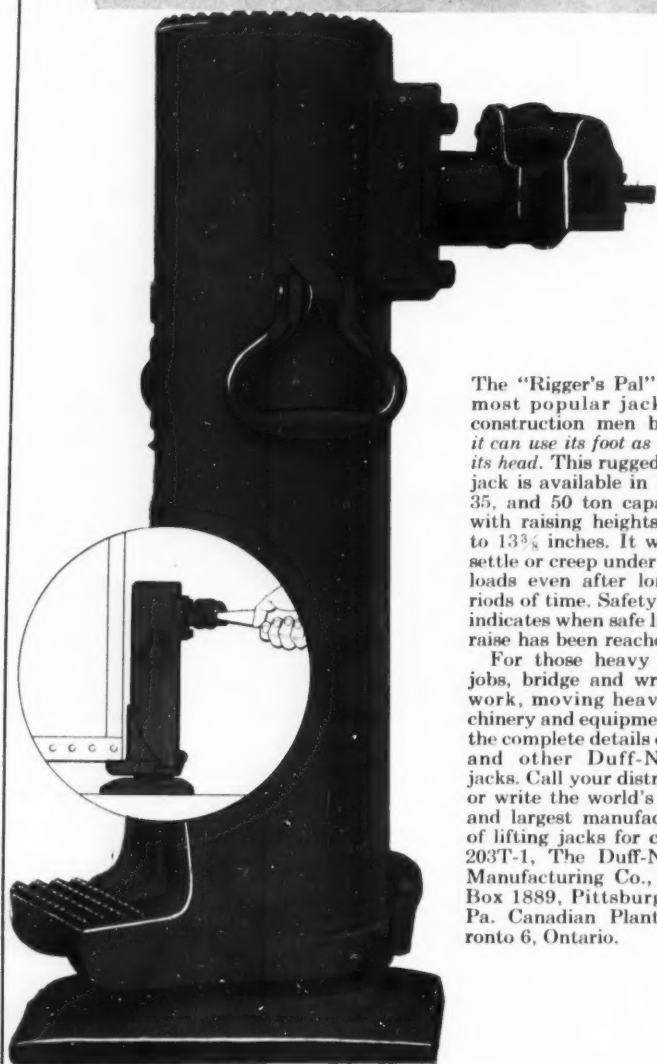
Load-Rated!

WIRE ROPE BLOCKS



Safe working capacity
embossed on side plate.
Every block packaged.

**Why the "Rigger's Pal" is the
most popular jack with
construction men!**



The "Rigger's Pal" is the most popular jack with construction men because it can use its foot as well as its head. This rugged screw jack is available in 15, 25, 35, and 50 ton capacities, with raising heights of 10 to 13³/₄ inches. It will not settle or creep under heavy loads even after long periods of time. Safety signal indicates when safe limit of raise has been reached.

For those heavy lifting jobs, bridge and wrecking work, moving heavy machinery and equipment, get the complete details on this and other Duff-Norton jacks. Call your distributor or write the world's oldest and largest manufacturers of lifting jacks for catalog 203T-1, The Duff-Norton Manufacturing Co., P. O. Box 1889, Pittsburgh 30, Pa. Canadian Plant—Toronto 6, Ontario.

DUFF-NORTON

Jacks

"Giving Industry A Lift Since 1883"

SALES AND SERVICE

... Continued from page 182

western regional sales manager, Joseph D. Tormey. Headquarters for the division will be at the company's main offices at Ardmore, Pa.

Armco Drainage & Metal Products, Inc.: The appointment of two new division managers has been announced. Tom M. Neibling has been appointed manager of the southwestern division with headquarters at Houston, Tex. William O. Robertson has been named manager of the eastern division with offices at Baltimore, Md.

Luria Engineering Co.: Grant A. Sattm has been promoted from general sales manager to vice-president in charge of sales.

Madsen Iron Works, Inc.: Announces the appointment of Glenn F. Worthington as sales manager.

Timken Roller Bearing Co.: Has announced the appointment of John Fellows as field engineer. His headquarters will be at the company's Milwaukee office.

U. S. Steel Corp.: Appointment of William K. Markwell as director of sales for Gunnison Homes, Inc., U. S. Steel's housing subsidiary, has been announced.

Chain Belt Co.: The Construction Machinery Division announces four changes involving sales personnel. Parker "Red" Eddy is appointed district sales manager of the Los Angeles office; John Heinrich district sales manager for the Kansas City office; Roy L. Peck has joined the division as a truck-mixer specialist with headquarters in Milwaukee; Frank Peddar is appointed special sales engineer for Rex De-Watering Pumps.

Hercules Motors Corp.: The increased use of Hercules gasoline and diesel engines and power units throughout the oil fields has resulted in the opening of new sales and service facilities in Oklahoma City. The new branch is located at 1117 Exchange Ave. and will be under the supervision of J. A. Embry, manager of Hercules Oilfield Division.

Schild Bantam Co.: Announced the appointment of C. W. Sholvin as district manager in a newly created sales territory covering eastern Ohio, Pennsylvania, West Virginia, Virginia and Maryland.

The Four Wheel Drive Auto Co.: G. F. DeCoursin has been appointed general sales manager.

The Heil Co.: H. C. Hummel will
(Continued on page 186)



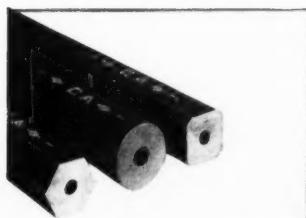
THE DRILL DOCTOR *CRUCIBLE HOLLOW DRILL ROD* *teamwork in specialties*

The modern, pneumatic rock drill beats out as many as 2000 violent impacts a minute. The man responsible for keeping these drills operating at top efficiency 'round-the-clock is the busy drill doctor.

With the high cost of labor and new equipment he knows that to provide good service his drill must be made of the finest steels obtainable. That's why he counts on Crucible.

For Crucible Hollow Drill Rods have demonstrated time and time again their ability to take it . . . to withstand the severest punishment with minimum breakage and bit loss. And Crucible mills are among the few that produce steels that meet the rigid requirements of the rock drill piston — a part that undergoes the toughest service known for steel.

To get the lowest cost per foot per hole in rock drilling, specify Crucible Hollow Drill Rods.



CRUCIBLE

53 years of *Fine* steelmaking

first name in special purpose steels

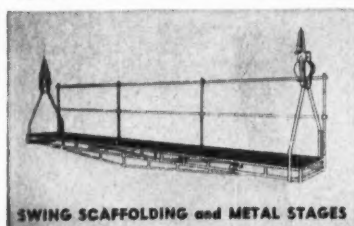
HOLLOW DRILL RODS

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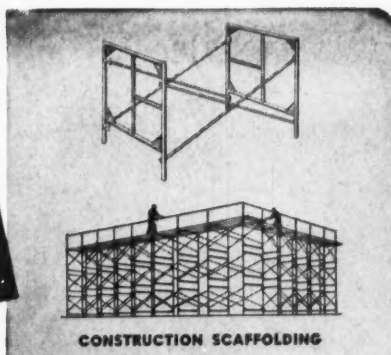
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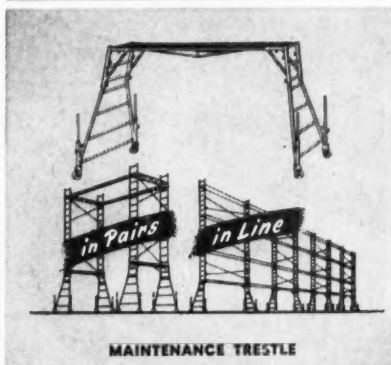
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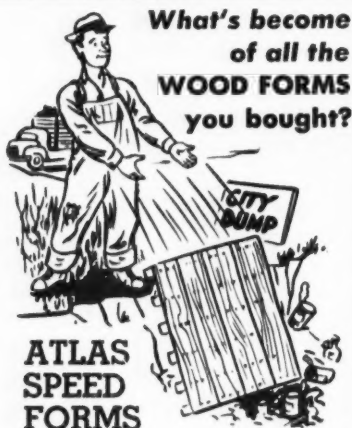
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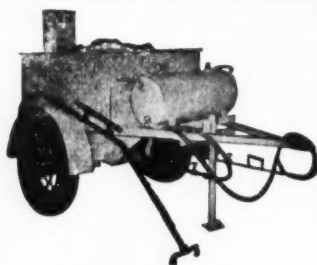
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Write for Circulars

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ELKHART 6

INDIANA

SALES AND SERVICE

. . . Continued from page 184

represent the Road Machinery Division in the Atlanta, Ga. district office.

Stewart-Warner Corp.: The appointment of William V. Ryan to general sales manager of the South Wind Division has been announced.

Macwhyte Co.: Thomas E. Burns has been appointed direct factory representative with headquarters in Houston, Tex. He will represent Macwhyte in their Houston territory including an area in Louisiana.

Mine Safety Appliances Co.: Has established headquarters and warehouse facilities in Kansas City for a new nine-state sales district. The new district includes Kansas, Missouri, Iowa, Nebraska, Minnesota, Wyoming, eastern Montana and North and South Dakota. Named sales manager of the new district was C. H. Mehaffey, former assistant manager of the Industrial Department of the company at Pittsburgh.

Quaker Rubber Corp., Div. of H. K. Porter Co., Inc.: The appointment of J. R. Alexander as general sales manager has been announced.

Harnischfeger Corp.: The promotion of George A. Schmus to manager of the Parts and Service Department has been announced. Mr. Schmus was formerly traffic manager.

R. G. LeTourneau, Inc.: Harry R. Powers, former eastern area sales manager, has been promoted to the post of domestic sales manager, succeeding R. P. Nichols who has joined the newly appointed LeTourneau distributor, Ryan Equipment Co. of St. Louis, Mo.

In the Main Office

Rosco Mfg. Co.: The election of J. A. (Jack) Miller as president has been announced. Mr. Miller was previously secretary of the company.

The Baker-Lull Corp.: Gilbert C. Strege has been appointed president. In confirming the appointment, the board of directors also approved the change in company name from the Lull Mfg. Corp.

Special Mention

Euclid Road Machinery Co.: Is setting up a spanking new replacement parts department under a separate division of the company to speed delivery and maintain sufficient inventory lead to meet all foreseeable demands.

Automatic International Business Machines glean pertinent information from coded cards, translate it
(Continued on page 188)



DRIVE-IT

dealer and engineering service



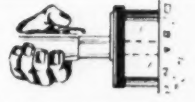


AIDS CONSTRUCTION

Midland Steel Products, Cleveland, Ohio, had an unusual fastening problem on hand when the 96-foot stack, pictured, and two 130-foot stacks needed lining with fireclay. The DRIVE-IT dealer passed the needed information to DRIVE-IT engineers who developed special pins that held in steel plates without completely penetrating. Wire mesh, to which fireclay later was plastered, is held by DRIVE-IT pins in steel plates. The contractor, Schaefer Bros. Co., chose DRIVE-IT as best solution after rejecting other fastening methods.



split-second fastening to **concrete steel**

Drive-It uses a small powder load to drive hardened steel pins into concrete or steel. No power lines! No drilling!

 <p>DRIVE-IT, the first powder actuated tool approved by Underwriters' Laboratory</p>	 <p>DRIVE-IT cannot be discharged accidentally due to the push and turn sequence. This, plus the large safety pad makes DRIVE-IT triple safe.</p>	 <p>Exclusive Automatic Barrel Extension for fastenings inside junction boxes or other recesses.</p>
 <p>DRIVE-IT is the only powder-actuated tool which requires but one standard power load regardless of penetration desired.</p>	 <p>Exclusive Swivel Safety Pad easily rotated for getting into close quarter work.</p>	<p>DRIVE-IT "300", lowest cost fastening tool. Low original cost and low operating cost.</p>



a drive-pin for every job

OVER 50 TYPES AND SIZES

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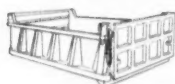
NEW HOIST RATINGS prove St. Paul best!



Tear out this ad . . . use it to compare St. Paul's "bonus capacities" with any other hoist. You'll find St. Paul gives you far more payload capacity per lb. of weight — at all body lengths! Your truck dealer, or St. Paul distributor will also show you why St. Paul's advanced mechanical and hydraulic improvements mean lower installation costs, added hours of smooth, trouble-free performance. Get the complete story on these great new St. Paul dump body hoists today, or write for free illustrated folder. St. Paul Hydraulic Hoist, Customer Service Dept., 36133 Main St., Wayne, Michigan.

Model	Wt. lbs.	Payload tons at body lengths shown									
		7'	8'	9'	10'	11'	12'	13'	14'	15'	16'
D-16	550	7	6								
N-16	650	9									
H-18	735		8	7	6						
H-20	795		10	9	8	7					
L-20	870		12½	11	10	9	8				
L-24	1020			12	11	10	9	8			
2 H 20	1370			17½	15½	14	13	12	11	10	
2 L 20	1555			22½	20	18	16	15	14	13	
2 L 24	1895			27½	24½	22	20	18	17	16	

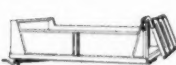
...also check St. Paul's complete new line of matching dump bodies



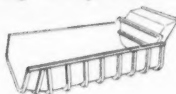
MODEL 301 Triple-strength contractor's body with pyramid side braces and boxed corner posts.



MODEL 106 Drop-side body with hinged sides and tail gate for easy hand loading with shovel.



MODEL 103 Combination dump and platform body with removable sides and corner posts.



MODEL 311 Heavy-duty rock-type body with scoop end for easy dumping of bulky loads.

OUR 41ST YEAR

St. Paul

HYDRAULIC

Hoists and Dump Bodies
Full-size Refuse Loaders
Elevating Gate Gates

oldest in reputation . . . newest in cost-saving features

S-HBC-7

SALES AND SERVICE

... Continued from page 186

into names and numbers on inventory sheets and (this is uncanny!) make out invoices for orders shipped—including the customer's name and address.

The parts program also introduces a distinctive new package for all Euc parts, with the familiar Euclid green label and its silhouetted "pioneer" prominent for ready identification.

Gar-Bro Mfg. Co.: New manufacturing facilities for concrete placing equipment have been set up in Peoria, Ill. The company plans to speed up its deliveries, at minimum freight cost, by manufacturing buckets, power-carts, hoppers and its 200 other concrete-handling items at both Peoria and Los Angeles. Walter F. Dexter will be in charge of the Peoria plant as resident manager.

The Dico Co.: Recently expanded its manufacturing operations in the material-handling field by purchasing the wheelbarrow business of the General Wheelbarrow Co. of Wichita, Kan.

A. O. Smith Corp.: Construction of a new and ultra-modern electrode plant in Lancaster, Pa., planned for completion by late July, has been started. The Pennsylvania site will mean a substantial saving in freight costs, as well as improved delivery service to customers.

Association Activities

Truck Mixer Manufacturers Bureau, National Ready Mixed Concrete Assn.: Otis H. Manchester, Jr., secretary-treasurer of Concrete Transport Mixer Co., St. Louis, was elected chairman at the annual meeting of the Bureau in Chicago.

Construction Industry Mfrs. Assn.: The following officers were elected to serve for the coming year—Harald T. Reishus, president; Ray McLean, 1st vice-president; L. G. Schraub, 2nd vice-president; Roy E. McCluskey, secretary-treasurer; and Harold F. Hess, executive vice-president.

Structural Clay Products Inst.: Has announced the appointment of Henry E. Bollman as executive director, a new post created by the Institute's board of directors.

American Road Builders' Assn.: Robert M. Reindollar, consulting engineer of Baltimore, was elected president at the association's convention held in Boston, Feb. 9-11. Other officers elected at the meeting include—four regional vice-presidents: Charles M. Noble for the North-western District; W. G. Pruett, Southern District; Julien R. Steelman, Central District; and Harmer E. Davis, Western District. Jennings Randolph was returned as treasurer.



Constructing a plant-mixed Texaco Asphalt pavement of the cold-laid type on Indiana State Highway 28 near Alexandria. Old pavement was widened and undersealed with asphalt. Contractor-Brooks Construction Co., Fort Wayne, Indiana

Indiana gives old highway a new **intermediate-type Asphalt surface**

Indiana chose one of the intermediate types of asphalt construction when it modernized this section of State Route 28 last year. The new surface is of the plant-mixed, cold-laid type, in which a Texaco Rapid-curing Cutback Asphalt serves as binder for the broken stone aggregate. This surface was put down in two courses, with an interval of five days between courses for curing and setting up. A seal coat of RC Cutback, covered with chips, completed the new pavement.

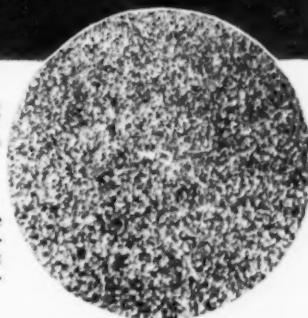
This is another of the complete range of road and street types which Texaco Asphalt Cements, Cutback Asphalts and Slow-curing Asphaltic Oils offer the road builder. These types vary in durability and in cost. Among them, you will find the answer to your own street, highway or airport improvement problem, with due consideration being given to traffic, available aggregate and budget limitations.

Whether used in a heavy-duty pavement or an inexpensive surface-treatment, Texaco Asphalt products deliver a consistently dependable performance, because they are refined from scientifically selected crudes and are backed by half a century of asphalt refining experience.

Helpful information about the various plant-mixed types of Texaco Asphalt paving, as well as those types in which Texaco products are applied by pressure distributor, is presented in two booklets which our nearest office will send you with no obligation on your part.



(above) Completed section of this intermediate type of Texaco Asphalt paving on Route 28.



(right) Close-up of the new pavement prior to application of the seal coat of Texaco RC Cutback Asphalt.



THE TEXAS COMPANY, Asphalt Sales Dept., 135 E. 42nd Street, New York City 17
Boston 16 • Chicago 4 • Denver 1 • Houston 1 • Jacksonville 2 • Minneapolis 3 • Philadelphia 2 • Richmond 19

TEXACO ASPHALT

(Advertisement)

LeTourneau pictures of the month . . .



BAGDAD HAULER — This 40-ton Tournarocker is one of Bagdad Copper Corp's haul units. The company, which mines copper at Bagdad, Ariz, also owns a 50-ton Tournarocker. Cycle of 4500 ft takes the 40-ton 'Rockers 11.2 min, despite 650

ft of 10% adverse grade and narrow haul roads. Cycle time includes 2 min to load from a 4-yd shovel, and 1/2 min to spot and dump. Disc-type 4-wheel air brakes let operator haul in 3rd gear along the narrow benches with complete confidence and safety.



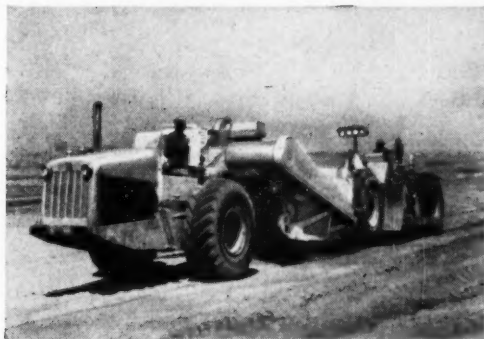
SCRAPER BECOMES DOZER — Down in sports-loving Uruguay, this D Tournapull self-loaded 52,300 yds of clay to level a site for a new stadium. Hourly output averaged 100 yds. With its dozer blade, the "D" also dozed fill and broke up the surface of a highway which crossed the stadium area.



22% MORE COAL — Stockpiling coal for a power station in Rhode Island, Tournatractor dozed 16,850 cu ft (420 tons) of coal in 2 hrs . . . outproduced a crawler-tractor working under identical conditions by 77 tons (or 22%). Coal was moved 190 ft down a gradual slope, then over a steep 25-ft bank.

(Advertisement)

Performance reports on LeTourneau equipment



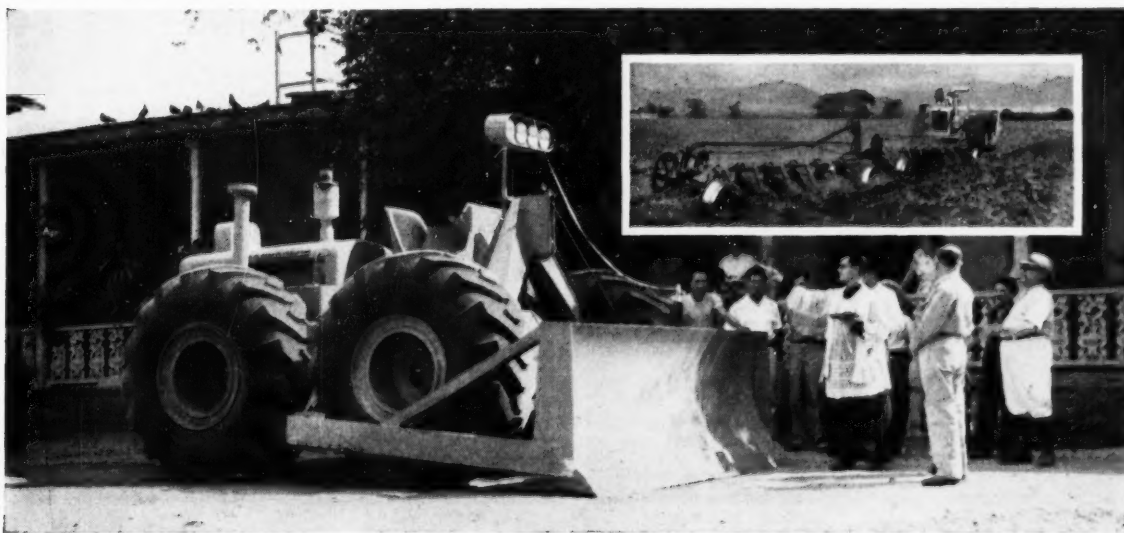
DIAMOND MINER — Near Kasai, Belgian Congo, 9 C Tournapulls and 5 Tournatractors are stripping 7,850,000 cu yds of overburden to uncover industrial diamond deposits. Push-loaded by a 186 hp Tournatractor, each Tournapull removes 6 to 7½ loads (59 to 73 pay yds) of clayey sand hourly on a 1-mile cycle.



LOVELY VIEW — New 16-yd scraper for C Tournapull mounts control motors on bracket above yoke. Says Bob King, operator for Kiker & Yount of Reidsville, N C, "This new Carryall has everything beat. With the motors up out of the way, I can watch the pusher better. This Carryall spreads better, too. Dirt really rolls out."



40% LOWER COSTS — No, these rocks weren't "frozen" into the Tournarocker. High-speed photography makes them look like it, but actually dump took only 5 to 10 seconds on this W. Va. road job. Contractor C. E. Wetherall also reports his Tournarockers give 40% lower hauling costs than trucks. Output for his two 9-ton Tournarockers on typical 1400-ft cycles: 144 pay yds of shovel-loaded rock hourly.

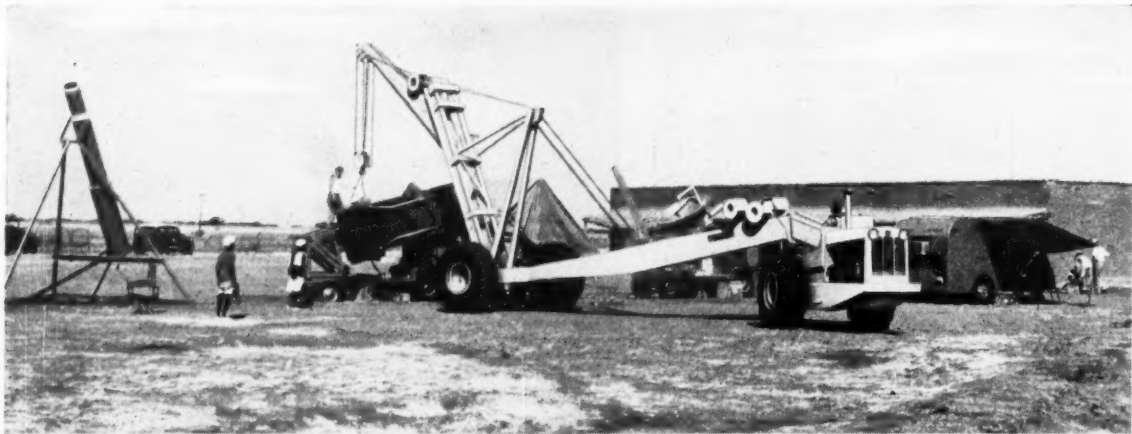


DOUBLE BLESSING — In ceremony, traditional all over South America, padre blesses new Tournatractor. Hacienda Pata-Poo, Peru owner of the unit, has received a blessing, too. Their 19 mph Tournatractor, pulling 2 gang disks, deep-plows 2½ acres hourly—twice crawler output. Tournatractor also pulls

24-in. ripper for sub-soiling. This tool digs 20 in. deep into hard clay, brings up sub-surface water unobtainable with other methods. Explains Plantation Manager de Miguel, "The extra water makes our cane grow healthier, weigh more, and increases sugar content — thus producing more sugar and more profits."

Continued on next page . . .

LeTourneau pictures of the month (cont'd.) . . .



336 HR JOB IN 12 HRS—When a last-minute telescope breakdown threatened success of the US Navy and National Geographic Society's Solar Eclipse expedition to Khar-toum, the Anglo-Egyptian Sudan Government came to the rescue. Its versatile 15-ton Tournacrawler carefully hoisted and positioned

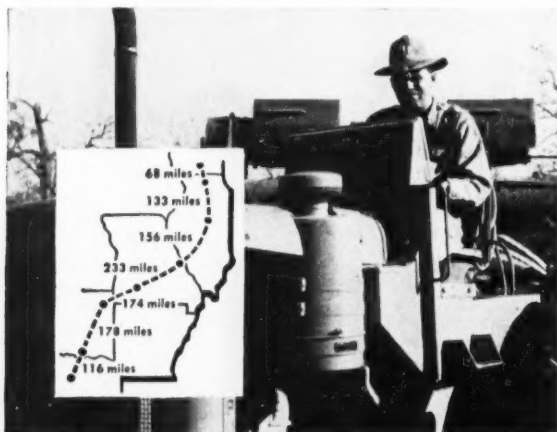
the delicate 2-ton dish-assembly. The job, which would have taken about 336 man-hrs if done by hand, took only 12 man-hrs with the Tournacrawler. Instead of missing the Eclipse they had traveled 7000 miles to see, astronomers not only saw the entire event, but had plenty of time to test and re-adjust settings.



60 LOADS PER HR — At Chemult, Ore, Tournapull tractor-pusher and 3 self-propelled scrapers account for 60 loads of pumice hourly on 600-ft haul. Load time for over 16 loose yds varies from 25 to 45 seconds. With slower-moving crawler-pusher, output would be about 1/3 less. Contractor: R. A. Heintz Construction Co, Portland, Oregon.



PRECISION SPREADING — Constructing a highway overpass at the intersection of U.S. 16 and State 190 near Pewaukee, Wis, C Tournapull spreads load of sandy clay on narrow fill. "Rig is really maneuverable," says Warren Mallo, Job Supt for prime contractors, J. R. Griffith Co, of Racine. "They never have to be backed up to turn around."



1058 MI FOR \$60 — Meet the record-holder — Bill Kastner of Madison, Wis! To find warm-weather dirtmoving, Contractor Kastner made the longest solo highway trip of the year with a Tournapull, 1058 miles, Wisconsin-to-Texas. He started the journey at 2 pm Jan 3 at Madison. By 6 pm that day, he had arrived at Rockford, Ill . . . 68 mi in 4 hrs. The second day he ran into a blizzard and made only 133 mi to



Bloomington, Ill. His next stop, on Jan 5, was St. Louis, 156 mi further. On Jan 6 he drove 233 mi to Springfield, Mo . . . Jan 7, 174 mi to Pryor, Okla . . . Jan 8, 178 mi to Durant, Okla. At 1:30 pm Jan 9, Kastner arrived in Arlington, Tex. In 6 days, he had driven 1,058 mi (all by daylight) . . . used 180 gals of fuel . . . average, 5.9 mi per gal. Total expenditure for fuel, lodging and food: \$59.98. Saving over rail freight: \$450.

Performance reports on LeTourneau equipment



8 JOBS FOR JOHNS-MANVILLE—Even though the temperature often reaches 50° below zero, Canadian Johns-Manville works their Tournatractor 24 hrs a day, 6 days a week at their asbestos pit near Matheson, Ontario. One winter month, rig put 535 hrs in on 8 scattered jobs (other hrs went for job-to-job travel, lubrication, etc.). Of total time, unit spent 238 hrs dozing ore to crusher, cleaning around 4 shovels, and main-

taining ore stockpile. Another 87 hrs went into tailings-dump maintenance. 62 hrs into waste-dump maintenance. Tournatractor worked 43 hrs towing compressors, wagon-drills, and other mine equipment. For 62 hrs, it plowed snow—in one typical 6¼-hr period, traveling 30 mi and opening 26 mi of road. For 43 hrs, it did such odd jobs as clearing rock and clay overburden, and helping shovels up steep grades. Its mechanical efficiency: 95%.



GRADES FOR AIRCRAFT FACTORY—

Tournatractor, with 2½-yd dozer, grades for construction of an aircraft parts factory near Monmouth County Airport, Allenwood, N.J. With down-pressure attachment on blade, rig makes smooth cut over uneven ground. Owner is E. I. Brown, Allenwood.



BRING ON THE DIRT — 5 new

C Tournapulls belonging to J. Robert Bazley Inc, Pottsville, Pa, line up for start of a 4-lane bypass around Hummelstown, Pa. For further information on any of these machines, write R. G. LeTourneau, Inc, Peoria, Ill.



Tournapull, Tournarocker, Tournacrane, Carryall—Trademark Reg. U.S. Pat. Off., Tournatractor—Trademark Pic. 358-C

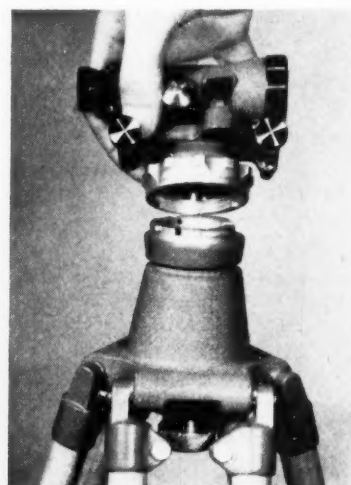
CONSTRUCTION EQUIPMENT NEWS



Ejector Extensions Prevent Scraper Spillover

Ejector extensions like the one shown here on a Cat No. 21 scraper are available on four other Cat scraper models as well—Nos. 15, 20, 70 and 80. Made of steel bars welded together and fastened to the ejector top, they're particularly

valuable when working in most, sticky soils that peel up into slabs and spill over the ejector top. Reduced spillage lessens the chances of cable fouling. Ejector in no way hinders shovel loading.—Caterpillar Tractor Co., Peoria, Ill.



Level Has No Footscrews

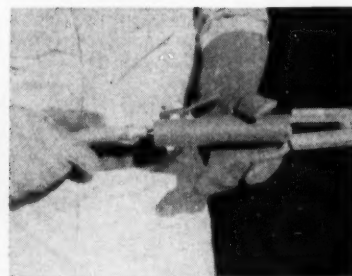
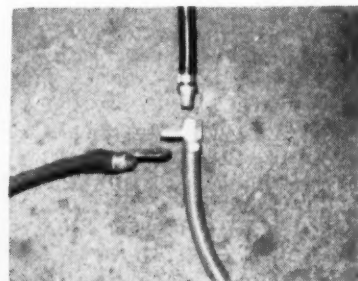
On the Kern GK-1 level a ball-and-socket joint replaces footscrews and permits setup in a few seconds. Degree markings can be read directly to 1/10, estimated to 1/20.—Paul Reinhart Co., Inc., 66 Beaver St., New York, N. Y.



White Has Power Package Replacement for Cranes

Industrial engines in White's No. 100 series are available as replacement power units for shovels, cranes and other pieces of equipment. Here White's sales manager for industrial engines, M. W. Brooks, checks installation of a Model 130-1A in a No. 51 Link-

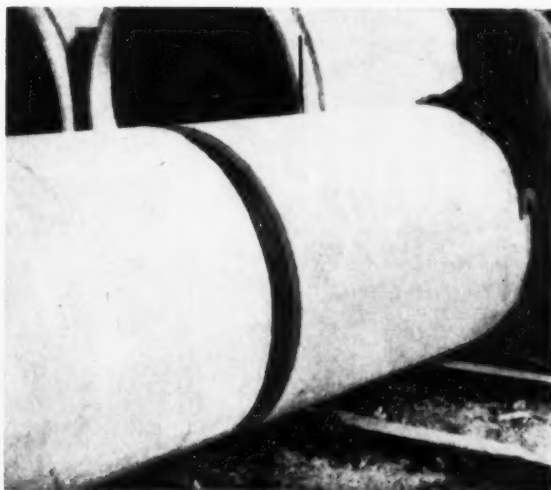
Belt Speeder owned by W. F. Biehl Inc., Berea, Ohio, while Mr. Biehl looks on. This model is rated at 65 hp at 1,400 rpm. Engines are available for shovels up to 3/4-yd capacity, cranes to 20-ton ratings, air compressors, saw mills, etc.—White Motor Co., Cleveland, Ohio.



Torch Uses Air and Arc

One lead from a welding machine and another from an air hose join in a concentric cable and are fitted to the Arcair torch for gouging all types of ferrous and non-ferrous alloys. Operating cost reported at \$1.50 to \$2 per hr.—Arcair Co., 2614 Burwell St., Bremerton, Wash.

On-the-Job Previews of Machinery, Tools and Equipment



Tylox Flexible-Rubber Gaskets Give Fast, Sure Seal on Pipeline Installations

The workman here is snapping a Tylox Type A gasket over the tongue of a pipe section immediately after coating the tongue with Tylox cement. Then after making sure that the gasket and tongue edges are even, he moves on to the next section. Later he coats the groove of the adjacent section in the ditch and forces the two sections together for a tight seal and

complete pack. Another gasket—Type B—is cast by manufacturers in “yarded” pipe or pipe in kilns, and is recommended in lines with head pressures up to 75 ft. With the A-type shown here, the manufacturer claims resiliency to compensate for angularity, contraction, expansion, soil stresses, resistance to acids, alkalis, oils.—Hamilton Kent Mfg. Co., Kent, Ohio.



Truck Body and Hoist Line Expanded

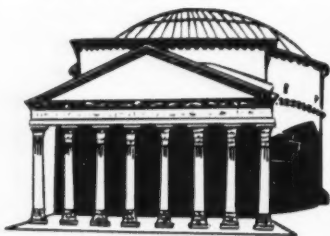
PicUPac Truck bodies and hoists have been available up to now only in $\frac{1}{2}$ -, $\frac{3}{4}$ - and 1-ton sizes. The new line includes medium-duty sizes in $1\frac{1}{2}$ -, 2- and $2\frac{1}{2}$ -ton models, and the company is now planning for a future line of heavy-duty models. Two hoist styles are made; one with double arms for extra heavy work and another for direct lifts of average loads.—Converto Mfg. Co., Cambridge City, Ind.



Snow Plow Added to Tracto-Lift

The latest attachment to be added to the Tracto-Lift is a snow plow, available in V or angle types. The V type remains stationary, throwing snow to both sides and leaving a swath 60 in. wide. The angle attachment shown above is 84 in. long and can be adjusted to a variety of angles to pile snow on one or both sides, as desired. Combined with the Tracto-Lift fork-lift truck or one of the company's Power

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DK 1 DOUBLE CIRCLE THEODOLITE

Outstanding proof of man's progress, the DK 1 is the ideal instrument for small builders. Extremely light and compact, it is specifically designed for portability. Sturdily built, old-world crafted to maintain high stability under extreme conditions, the DK 1 offers direct reading to 10 minutes, estimations to 1 minute. Identical in design and construction to the world-renowned DKM 1 (but without optical micrometer), the Kern DK 1 is a tribute to the perfection of today... an answer to the problems of tomorrow.

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CONSTRUCTION EQUIPMENT NEWS

... Continued

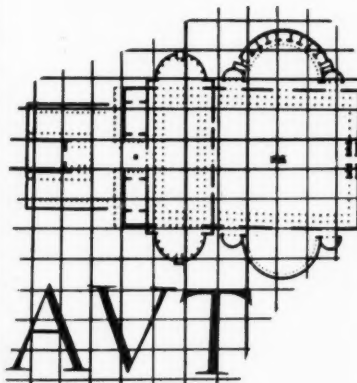
King series (CM&E, April '52, p 173), it's recommended for heavy pushing work. Features are ability to travel at tractor speeds, extra maneuverability, high under-clearance, climbing power.—**Tracto-Lift Co., 800 E. 18th St., Kansas City, Mo.**



PORTABLE HOISTING MACHINE

—There are several kinds of hoisting machines available for the construction industry, and they all do good work, but the Buck machine can be dismantled and moved to another location (or to another site) and be working there in a matter of minutes. This 2,000-lb capacity rig, equipped with a self-dumping ½-yd Buck concrete bucket and a two-wheelbarrow platform, is performing almost all the materials-handling jobs on the Thomas J. Logan Chemistry Building at Xavier U. in Cincinnati. Contractor is the Dawson-Evans Construction Co. According to Walter Gaebel, job super, the machine hoisted and dumped concrete mix for the second floor faster than crews could take it away from the hopper. Maximum requirement was 15 yd per hr, and the machine easily delivered 20, he said. Here it's shown repeating the performance at the third-floor level. In this spot tower height is 60 ft. Brick contractor on the job is Cummings Bros. Co. of Covington, Ky. Charles Cummings, head of the company, states that the average "around town" cost for lowering and removing the Buck machine—and setting it up again—is "only from \$9 to \$10." It's set up in less than 25 min usually and is self-erecting to 40 ft. Mechanism raises or lowers the tower sections in 2 min, 11 sec, according to the manufacturer. As the tower goes up, its wheels retract; as it lowers, they return to towing position. Its lift rate is 2,000 lb at 100 ft per min.—**Buck Equipment Corp., Cincinnati 2, Ohio.**

BLUEPRINT FOR BEAUTY... FIVE HUNDRED B.C.



The Wonder That
Was Rome...



Kern
AARAU

Depended in large measure on the skill and brilliance of her draftsmen and architects. Relying on primitive instruments... rough, uncertain equipment... they performed feats of design at which men still marvel.

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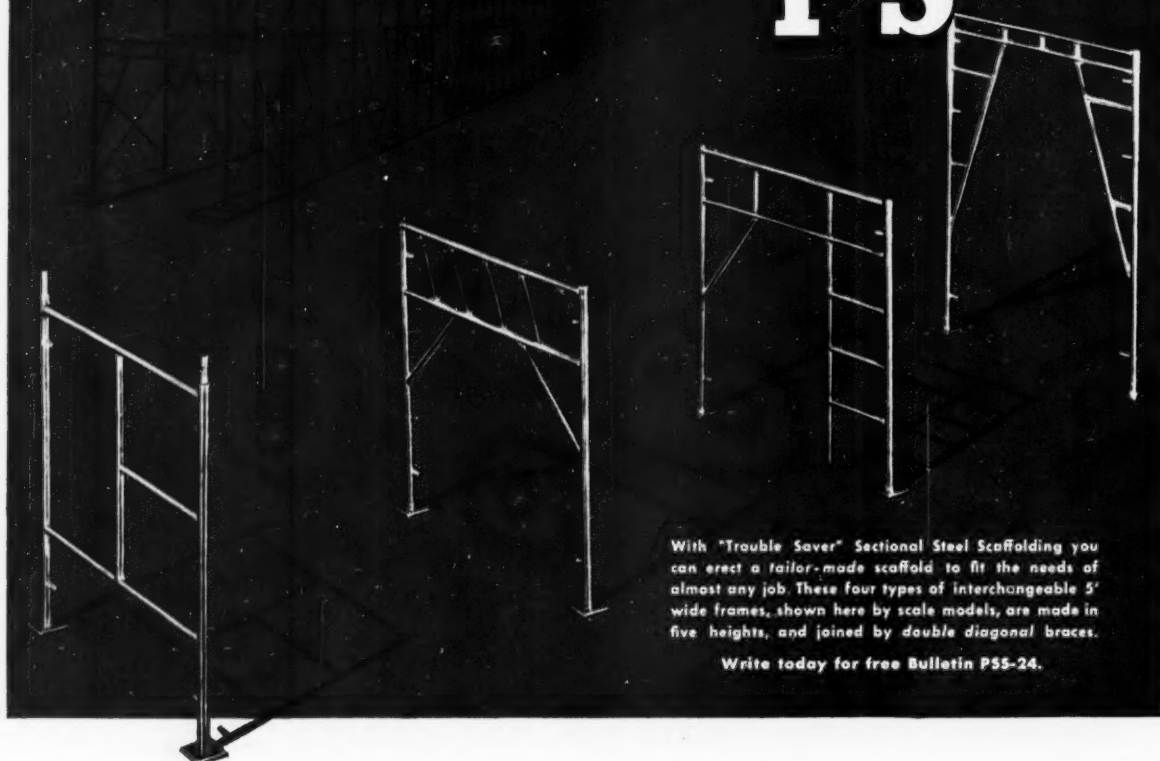
Singly or in combination, one or more of the many **Wear-Arc** hard-facing alloy electrodes will handle every known rebuilding and hard-facing problem. Why experiment... why depend on the unknown, the untested? For every application where wear patterns must be corrected to resist impact, abrasion, compression, heat, and corrosion... insist on genuine **Wear-Arc** Electrodes, one of Alloy Rods Company's six famous brands!

Wear-Arc 3 to build up carbon steel... **Wear-Arc 6** for heavy impact, abrasion, and compression... **Wear-Arc 40** and **Wear-Flame 40** for light impact and severe abrasion... **Wear-Arc A** and **Wear-Flame A** cobalt-chromium-tungsten type for light impact, wear resistance, heat, and corrosion... **Wear-Arc B** and **Wear-Flame B** cobalt-chromium-tungsten type for heat, corrosion, and abrasion combined with impact... **Wear-Arc** and **Wear-Flame** Tungsten Carbide the ultimate in abrasion resistance.

AR-14
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PS



With "Trouble Saver" Sectional Steel Scaffolding you can erect a tailor-made scaffold to fit the needs of almost any job. These four types of interchangeable 5' wide frames, shown here by scale models, are made in five heights, and joined by double diagonal braces.

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And remember this is *just one of many PS Scaffolds*. PS has the only complete line—a convenience offered by no other supplier. That's why so many contractors, large and small, and from coast to coast, say "*when it comes to scaffolding . . . come to PS.*"

Buy it... or Rent it!



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PS offers a national service available locally. See the "yellow pages" of your 'phone book for the nearest PS Co. office or representative handling "Gold Medal" Scaffolds.



AIR-CUSHIONED VIBRATOR—According to the manufacturer, people working near a Cleveland Air-Cushioned vibrator hardly know it is operating. All of the bothersome noise has been eliminated, and the unit is being used for many varied applications. The photo here shows one installed on an aggregate bin for loosening and insuring free flow of concrete block materials. Vibration speed and vibration intensity can be varied at will. Other uses in the construction field include installation on bins, hoppers, chutes, Pumpcrete tubes and on all kinds of concrete wall and floor forms.—**Cleveland Vibrator Co., 2828 Clinton Ave., Cleveland, Ohio.**

VAPOR-SEAL DUCT INSULATION—Fiberglas vapor-seal duct insulation has been designed to prevent condensation on air conditioning ducts which carry cool air in warm, humid areas. This condensation, which forms on ducts, creates a serious problem in warm, humid areas, and the new type material is said to stop condensation by enclosing the duct in thermal insulation that has a built-in vapor barrier of asphalt and kraft paper. Insulation alone has not solved the problem since the vapor passes through it eventually, and damp insulation loses its thermal insulating value. In addition, condensation may damage the duct, its exterior finish and even the internal construction of the building. The company claims that the use of Fiberglas vapor-seal duct insulation helps lower costs because it is applied in a single operation. Material is furnished in 24x48-in. panels and in thicknesses of $\frac{3}{4}$, 1, $1\frac{1}{2}$ and 2 in. Like Fiberglas itself, vapor-seal duct insulation may be cut easily and accurately to any shape. A 1-in. thickness of the material weighs only about $\frac{1}{2}$ lb per sq ft. Owens-Corning engineers point out that if the insulation is used where it is exposed to weather or abuse, it must be protected by a covering of canvas and paint, sheet metal or roofing felt.—**Owens-Corning Fiberglas Corp., Toledo 1, Ohio**

TRAILER FOR CONSTRUCTION MEN—New trailer coaches designed to provide a comfortable mobile home for construction workers have been announced. They are 31 ft long and available in two styles. They will sleep four or six persons. The length of both models is the same. The extra bedroom of the six-sleeper uses space gained by slightly shortening the living room and replacing the bathtub with a shower. A large living room table provides ideal work surface for blueprints and plans and, when not in use, table sections can be stored in a closet. The 12-ft living room is completely furnished with a long sofa, modern chairs,

plastic cone-shaped lights, venetian blinds, draperies, inlaid linoleum floor, and a large wall mirror. Behind the living room is a compact U-shaped kitchen with an apartment-size gas range, double-bowl sink, work surfaces covered with Formica, and several overhead cupboards. Opposite the sink is a 6-cu ft refrigerator between two large closets, one for wardrobe and the other for brooms, etc. Two other wardrobes are accessible from the bedroom. An electric water heater is concealed beneath the sink. Both models have complete sanitary facilities.—**Trotwood Trailers, Inc., Trotwood, Ohio**

How the MOTO-PAVER



View of S. George St., Rome, showing one "slab" laid against the far curb.



The completed resurfacing job—a smooth, waveless surface.

Cut Resurfacing Costs in Rome (N. Y.)

Shown above are before and after views of a recent street resurfacing program in Rome, N. Y., in which a H & B Moto-Paver was used. This program involved a total of 2.47 miles, at an average cost of 52c per sq. yard, including all materials, labor and equipment rental costs. (Approximately 60 days after the paving was completed, a light seal coat was applied. Cost of this seal coat was not included in the 52c.)

Moto-Paver does the complete mixing and laying job—in one con-

tinuous operation. As shown here, it produces a smooth, waveless surface—even on rough, rutty and irregular pavements. Road speeds up to 25 mph. make possible quick moves from job to job. Moto-Paver gives a uniform mix using beach sand, gravel, crushed stone or slag aggregates, and tars, cutback asphalts, road oils, emulsions or other bituminous materials.

For specifications and further information see your local H & B distributor or write for Bulletin MP 49.



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Engineers—Manufacturers

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TOUGHEST · FASTEST · MOST EFFICIENT

BLAST HOLE DRILLS

Fast, mobile McCarthy Vertical Blast Hole Drills cut blasting costs of the Apex Powder Company by more than 20% as compared to air, well or churn drilling on the two-million dollar, five-mile superhighway (Route 62) from Hubbard, Ohio, to Sharon, Pa. Cutting through two large areas of concentrated rock, 150 holes, 15 ft. deep, were drilled for each blasting pattern. About 3,000 cubic yards of sand rock were moved at each blast. Due to the ruggedness and mobility of McCarthy drills, the job was completed ahead of schedule. McCarthy drills can work for you too! Write to The Salem Tool Company direct for further information and our distributor will contact you promptly.

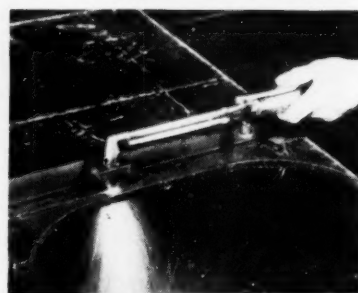
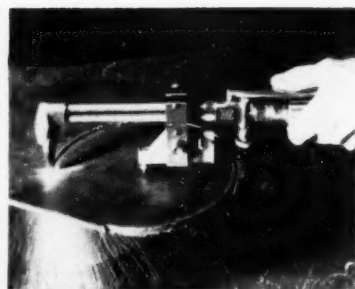
Also manufacturers of Underground Horizontal Auger Drills

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**Heavy-
Rugged
Powerful**



GUIDES FOR METAL CUTTING—

A series of precision-type cutting guides for gas-flame metal-cutting torches has been designed to provide workmen with low-cost attachments for accurate work. The small circle cutting guide at left, for example, can cut circles of from 1- to 15-in. dia while a larger one handles circles from 10- to 66-in. dia. The straight-line guide at right can be shifted for perpendicular cuts, or at any angle. Bevel cuts at 45 and 60 deg can also be handled. Guides can be attached to torches in 2 or 3 min, and all clamping is hand tight. Built-in positioning fixtures are designed to hold torch tips constantly at most effective distance from the metal to be cut. The resulting neater cuts need little or no additional grinding or machine finishing, according to the manufacturer. Guides are offered singly or in kits, and some users have reported that they have been able to fabricate parts with the guides for which they would ordinarily have to wait several days for delivery.—New Era Engineering Co., Dept. G-29, 458 W. 29th St., Chicago 16, Ill.

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HEAVY DUTY FLOOD LAMPS

For Better Light—Longer Service—Lower Cost

**Especially Designed for Efficient
Service on Shovels, Excavators,
Drag-Lines, Roadbuilding Equipment—
Locomotive Cranes, Tractors...**



Rubber Mounted Base—
Standard Model



Portable STURDILITE

New model for inside or outside use. Equipped with convenient carrying handle and substantial pedestal base. Spring-mounted light socket. 4-ft. cord and connector. For all voltages. Weighs only 12 lbs.

STURDILITE Heavy-Duty Flood Lamps provide specially high light intensity and spread, heavily constructed for years of trouble-free service. Hermetically sealed-beam lamp—no reflector to tarnish. Spring-mounted socket. Complete assembly mounted on rubber cushioned base to absorb vibration and shocks. Available in 6-8, 12-16, 24-28 and 110-120 voltages.

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Specifications, Quantity Prices

Metal Spinning Division
PHOENIX PRODUCTS COMPANY

4729 N. 27TH STREET, MILWAUKEE 16, WISCONSIN

KAYLO ROOF TILE RENAMED —

To most people the word tile portrays a vitreous product such as is used on floors, walls and ceilings—or a ceramic product for roof covering or sewer lines. This manufacturer found that its insulating roof tile was being mistaken for such products, so has officially changed the product name to Kaylo Roof Deck. There is no change in the product itself, but the new name easily identifies it with its prime purpose, minimizing the possibility of misunderstanding as to its application.—Owens-Illinois Glass Co., Toledo 1, Ohio

**Cutting fleet costs on
OPERATION:**

START-STOP!



**Now, over 90,000 miles
between overhauls with . . .**

STANOLUBE HD-M
REG. U. S. PAT. OFF.
Motor Oil

● Buri's Sunlit Bakery, Eau Claire, Wisconsin, kept its fleet of trucks hustling to deliver fresh bakery goods on schedule over ever busier routes. More continuous operation and tougher start-stop conditions caused maintenance troubles. Individual units averaged only 40,000 miles between overhauls.

Upon the advice of a Standard Oil automotive lubrication specialist, the fleet was switched to STANOLUBE HD, Standard's original heavy-duty motor oil. Deposit troubles previously experienced with a conventional lubricant were eliminated. Mileage between overhauls for individual units approached 90,000.

Recently, the officials of Buri's Sunlit Bakery adopted Standard's new and better STANOLUBE HD-M Motor Oil for use in their fleet engines. When one of the units was overhauled after 97,000 miles operation on STANOLUBE HD-M, engine internal parts were found to be clean as new. Officials report that through use of Standard's products and service they have reduced maintenance costs 30%.

Make the experience of this fleet your basis for investigating the benefits offered by STANOLUBE HD-M Motor Oil. You can obtain the services of a Standard Oil Automotive Engineer by phoning your local Standard (Indiana) office. Or, write: Standard Oil Co., 910 S. Michigan Ave., Chicago 80, Ill.

STANDARD OIL COMPANY (Indiana)



5 or 6 INCH AUGERS..
drill up to 80 feet
4 1/4 INCH AUGERS..
drill to greater depths

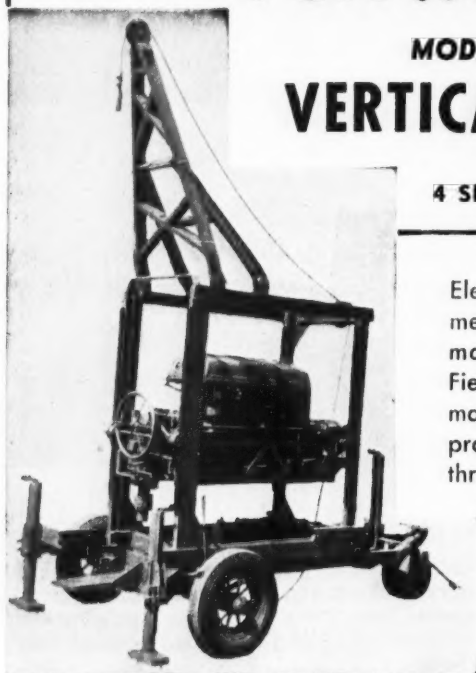
Parmanco

MODEL 51V

VERTICAL DRILL

HEAVY DUTY

4 SPEEDS AND REVERSE



NOTE: 3 Jacks for leveling machine.
 This Parmanco feature insures straight
 holes.

Eleven years of development have gone into Parmanco vertical drills. Field tests have been made in every type of prospecting and stripping throughout the world.

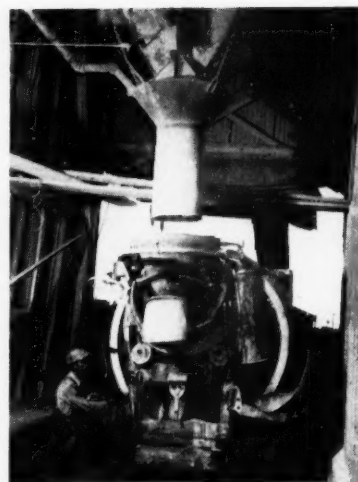
Here is a mobile drilling tool, built around a 40 h.p. Ford motor and to user's conditions and requirements. In use today in many fields, it is speeding and simplifying jobs.

In a recent field test an accurate sample was taken in 30 minutes thru 25 feet of overburden. This was done adjacent to an identical test hole that had taken 8 days to drill and sample by hand.

This Model 51V has four auger rotating speeds and reverse. It has proved its ability to meet the requirements of the general prospecting field where it is not necessary to drill solid limestone.

This machine (Model 51WV) is also built around a Wisconsin 25 h.p. air-cooled motor, 4 speed transmission and self-starter.

PARIS MANUFACTURING CO. PARIS, ILL.



RUBBER HOSE TO TRANSFER CONCRETE—A rubber hose developed to transfer concrete from batch bin to transit mixers is said to outlast the old canvas spout by a ratio of six months to one week. Although first cost is a good deal higher than a canvas tube, the advantage lies in extra long life. In addition, ready-mix companies report that the new hoses remain flexible throughout their life, whereas canvas absorbs concrete and stiffens up. The hose is also said to be easier to clean and remains free from clogging. Frequency of spout change should drop considerably, keeping a free flow of expensive equipment running in and out of the mix plant. The new hose is made in various sizes ranging from 18 to 24 in. in diameter and in lengths from 18 to 36 in. It's made from natural rubber reinforced with two plies of special fabric.—U. S. Rubber Co., Mechanical Goods Div., Rockefeller Center, New York 20, N. Y.

COMBINED FURNACE AND AIR CONDITIONER—Last month this manufacturer entered the mass market with a package called the Command-Aire twins—a home air conditioner and an oil- or gas-fired furnace. Up to now the company has restricted its air-conditioning business to custom-built installations. The two units, styled exactly alike, can be used independently or together. Thus a contractor (or home owner) can install the furnace when the house is built and add the air-conditioning unit at a later date. The units are compact enough to fit into 7 2/3 cu ft of space, or the area of a small closet. The company plans to turn out between 4,000 and 5,000 units of each type this year. Besides the contract builder, current owners of houses are potential buyers for the air-conditioning unit to increase the value of an older home. The distributors, through their dealers, will offer to install twin units in a build-

er's model homes and homes for sale. If at the end of 90 days the builder hasn't sold the house with both units installed, the distributor will remove the air conditioner without charge. In this way the company is almost sure to sell the furnace as a starter and will inform the home buyer later of the ease of installing the air conditioner at a later date. **Bryant Heater Div., Affiliated Gas Equipment, Inc., 17877 St. Clair, Cleveland, Ohio**



SHIFTING LEVER—A completely new type of shifting mechanism is now standard equipment on the A and C Tournamatic Tournapulls and the Super C Tornadozer. Pictured above, it consists of a quadrant lever for selecting speeds in a logical sequence, both forward and reverse. Placed next to the operator's right leg, it's extremely easy to operate and permits him to wear gloves when shifting. Speeds are clearly indicated on an aluminum plate with forward speeds up front and reverse speeds in back. Tournaticker switches in the mechanism actuate solenoids to engage or disengage the various clutches in the Tournamatic transmission. Users claim that the device makes the breaking-in of a new operator a lot easier. A light pause is permitted between gear shifts, eliminating the frequency of shock loads. In addition, the possibility of getting into two or more gears at the same time is eliminated. —**R. G. LeTourneau, Inc, Peoria, Ill.**

HOT OIL HEATERS—After an exhaustive investigation into the heating needs of industry, this manufacturer has added to its extensive line of oil- and gas-burning equipment the Hopkins Hot Oil Heater. It's built to ASME boiler codes and can burn any grade of fuel oil or natural gas. Equipped with UL-approved controls, the units can produce 1, 2 or 3 million Btu's per hr. Among the features of the Hot Oil Heater is the freedom from freeze and rust worries that accompany ordinary steam systems. The units are shipped as a complete, tested package, ready for installation. —**Hopkins Volcanic Specialties, Inc., Alliance, Ohio**

What bulk materials do you handle?

Versatile FARQUHAR

Trough Conveyors

*will move it faster
with less labor!*

Frank Casilio & Sons, a concrete block company in Bethlehem, Pa., moves aggregates from hopper-bottom cars to storage bins, with the aid of this Farquhar Conveyor and Car Unloader.



◀ A mid-west firm finds its Farquhar Conveyor, with the Farquhar Car Unloader, makes short work of unloading phosphate from cars to storage piles.

AGGREGATES, dirt, coal, chemicals, wet cement—Farquhar moves them all, saving you manpower and time. Farquhar Trough Conveyors are dependable, engineered to move material efficiently and to give you trouble-free service for years. Their low feed end makes them perfect for unloading hopper bottom cars, in combination with Farquhar Car Unloaders. Where loading is done by hand, the low feed end permits scraping of material to the carrying belt. If you handle any bulk material, Farquhar Trough

Conveyors can save you money by saving you time and labor . . . and pay for themselves in a short time.

Whether you move coal, gravel, sand, aggregates, cartons, boxes, bundles, bales, or any kind of bulk or packaged materials—horizontally or from floor to floor—Farquhar can cut your handling costs to rock bottom! One or more of the complete line of Farquhar portable, semi-permanent power-belt or gravity conveyors will solve your handling problems. Our engineers will be glad to consult with you . . . at no obligation!

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AND
GRAVITY
CONVEYORS**

Gentlemen:
Please send me my free copy of "Owners Report."

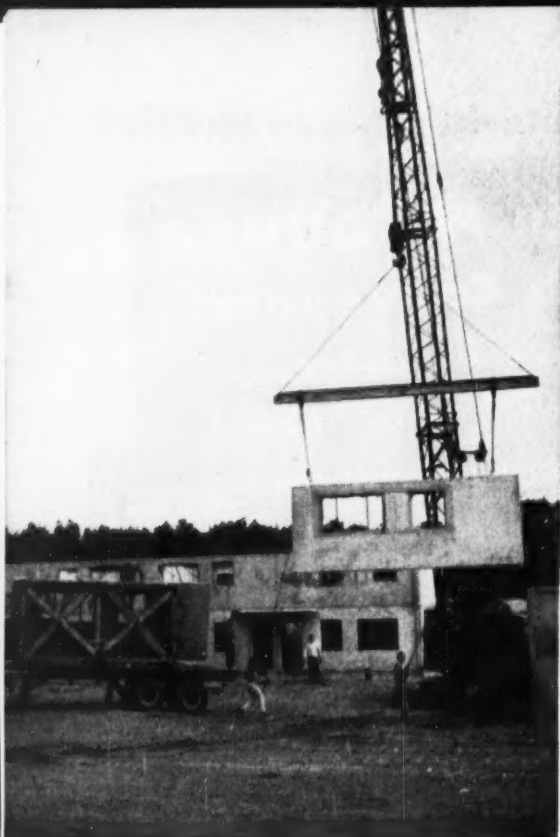
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Firm

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City

Zone State



\$7,000,000 was spent last year for materials and equipment by Corbetta Construction Co. of New York City. Listed high on the materials total were 105,000 cubic yards of concrete, 11,000 tons of reinforcing steel, and 2,800,000 board feet of lumber. Shown above is a precast concrete wall section being placed on one of the 1,000 James Forrestal Houses at Great Lakes, Ill. Many types of materials go into each job. Therefore, when economies can be effected in the field, material specifications are changed, with owner's permission, and other materials substituted. For this reason you can not always depend on the consultant's material specifications for your order; many purchase orders originate in the field.

Large prestressed concrete job in Georgia required 15,000 yards of concrete and a variety of equipment: 5 cranes, job-built wire mesh bender and cutter, 1 "dozer," 1 material hoist, 1 air compressor, 1 vacuum pump, 1 compaction roller, 1 trencher, 4 concrete vibrators, 1 water pump, 2 concrete paving breakers, 7 welding machines, 1 hauling tractor, 3 truck trailers, 5 dump trucks,

With A 150 Man Staff And 1200 Workmen, Corbetta Construction Co. Completed \$18-Million Worth of Work In 1952

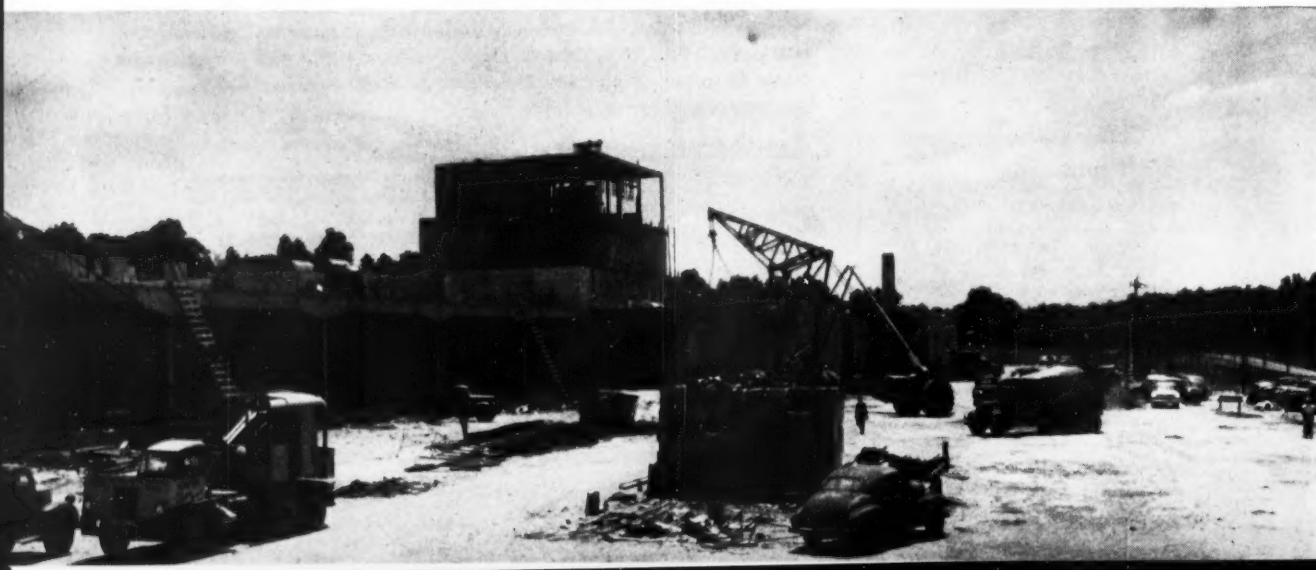
They worked at 9 locations in 5 states on the following jobs: Concrete pier at Haverstraw, N. Y. . . . Army finance center at Indianapolis, Ind. . . . Food processing plant in Decatur, Ga. . . . Laboratory at Norwalk, Conn. . . . Warehouses at Great Lakes, Ill. . . . Four different housing projects in and around New York City.

Each of the 9 jobs required: (1) a different combination of Corbetta's 150 man staff to direct the construction; (2) a new combination of Corbetta's \$800,000 worth of equipment; (3) the purchase and assembly of brand new construction materials and equipment. Throughout the year these men had a hand in purchasing \$7,000,000 worth of equipment and materials for these jobs.

Can your sales staff keep track of 150 men working for one contractor, on 9 jobs, in 5 states? "METHODS" can. Right now there are 31 subscriptions of CONSTRUCTION METHODS AND EQUIPMENT going to project managers, foremen, engineers, superintendents, etc., in Corbetta Construction Co. Put "METHODS" on your sales staff to contact these, and "METHODS" 31,000 other buying influences in the \$32-billion construction market.

Now let's look at some of Corbetta's jobs and see how varied the buying habits can be.

1 concrete mixer, 1 portable electric generator and 1 table saw. Two buying characteristics on these long jobs: equipment is constantly wearing out, requiring frequent new purchases; materials specs in many instances stay open. For these reasons selling is a continuous job, requiring constant callers.





\$800,000 worth of construction equipment is owned by the Corbetta Equipment Co., wholly owned subsidiary of Corbetta Construction Co. The terrific strain on construction machinery in constant use keeps Corbetta's repair and maintenance crews busy on their 20 trucks, 9 cranes, 8 tractors, and other construction equipment. Repairs require spare parts: last year \$58,000 worth were purchased. Buying of big equipment is centralized, but men in the field have a big voice in the final purchase. Shown above under construction is Pier 57 for New York City. Built at Haverstraw, N. Y., it was later floated down the Hudson to the

pier site. You'll see in the background a concrete batching plant built especially for this job.

Here's another example of contractors' buying habits. There are 10 concrete floor finishers, 6 concrete grinders, 4 paving breakers, 35 concrete chipping hammers, plus hundreds of other hand tools being used by Corbetta's 1200 workmen. The small power tools are shipped from their N. Y. yard when available—otherwise they're bought at the job site. Hand tools are bought on the job as needed.

As shown, the buying habits and buying influences vary. For these reasons it's necessary to keep in contact with all buying influences, at all times, at all job locations. The 31 CM&E subscriptions going to Corbetta project managers, foremen, superintendents, chiefs of party, engineers, etc., are reaching these buying influences each month at 6 job locations, thus simplifying your sales contact problem.

Corbetta is only one of 1,908 contractors who each received over \$1-million worth of contracts and one of 6738 who each received contracts of over \$100,000, as listed on our 1952 Contractor List.

More facts on contractors—who they are, where they are, and how they buy, are yours for the asking. Call or write your "METHODS" salesman. Ask him too, about the eighteen monthly Readex Reader Interest Reports that show reader interest of every CM&E editorial and advertising item. These reports can help you prepare more effective advertisements.

CONSTRUCTION METHODS AND EQUIPMENT



A MCGRAW-HILL PUBLICATION
330 WEST 42nd STREET, NEW YORK 36, N. Y.



**WINS TOUGH CONTRACTS
WHERE OTHERS HAVE FAILED . . .**



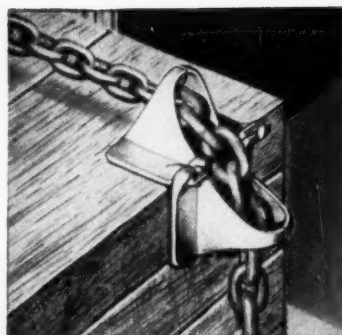
Oregon Transfer Company of Portland secures many jobs because of its MICHIGAN Truck Crane . . . tough jobs which other contractors have given up because of crane failures.

For example, the MICHIGAN'S superiority was responsible for a sub-contract on the new Folger Coffee Company construction in Portland. Here, in spite of poor soil conditions, the MICHIGAN got into the site easily. Working into tight corners, it kept concrete moving to the forms with no delays, resulting in the successful completion of the contract. In addition, the MICHIGAN played an important part in other construction work at the site. In the opinion of veteran crane operator C. J. Nash, an outstanding feature of the MICHIGAN is its exceptionally rugged rear axle construction.

Get all the facts about truck cranes and you, too, will select MICHIGAN . . . engineered for tough going by America's pioneer truck excavator-crane builders.

MICHIGAN POWER SHOVEL COMPANY

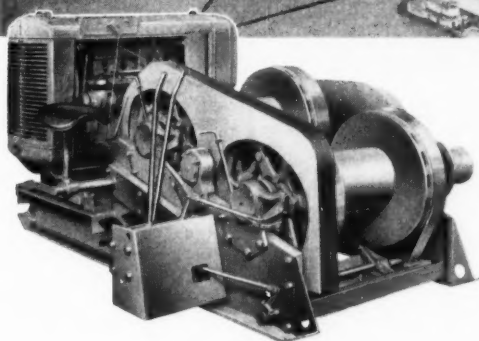
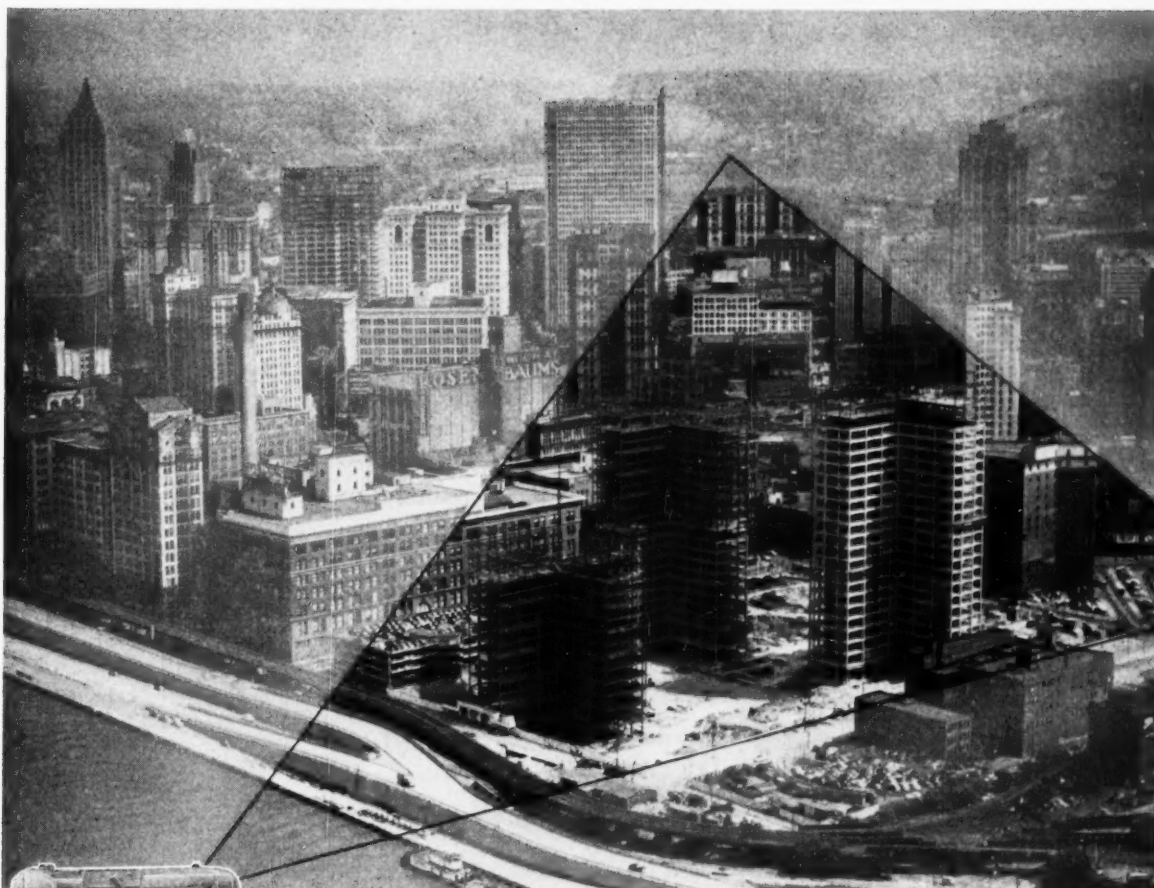
495 Second Street, Benton Harbor, Michigan, U.S.A.



HINGE PROTECTORS—The two pieces of the load protector shown here hinge together to make a unit that will accept chain, wire rope or cable and will swing from 90 to 180 deg. They've been tested on moving loads of pipe, tubing, lumber, crating and have aided in protective unloading, as well. Cable or chain up to and including 1/2 in. may be used if a grabhook is already secured to a chain, it can be threaded through the unit. The two pieces may be separated and used singly, if desired.—Canton Mfg. Co., 2408 13th St., N.E., Canton, Ohio.

LUBRICANT AND PRESERVATIVE

—When internal combustion engines are temporarily taken out of service for storage or shipment, they must be properly lubricated for service preceding or following this stand-by period and must also be protected against rust and acidic products of combustion while unused. Instead of tending to these needs with separate products, the manufacturer's new dual-purpose product can be used. Produced in two grades, Texaco Preservative Oil 10 and 30 function both as lubricant and preservative. The company's research experts investigated humidity, condensation and corrosion, and the resultant product combines special additives developed to insure maximum preservation of internal engine surfaces with motor-oil additives of the type used in heavy-duty lubricants. One of many tests requires that steel panels, which have been dipped in preservative oil, should remain free of corrosion after 200 hr exposure in a humidity cabinet at 100 deg F and 95-100% relative humidity. The new formulation gives such protection for more than 1,000 hr, according to the manufacturer. In addition to its application in the engines of vehicles scheduled for storage or shipment, the new lubricant-preservative has proved useful in other internal combustion engines in intermittent service. When functioning as a lubricant, the preservative oil is compatible with qualified heavy-duty motor oils and need not be changed until the engine has reached its normal drain-and-refill point.—The Texas Co., 135 E. 42nd St., New York, N. Y.



the record of performance on the golden triangle points to Clyde's value

Investigate the complete line of Clyde Band Friction Hoists whether your need is a hoist for setting steel, hoisting concrete or high cycle material rehandling . . . there's a Clyde to do a better job. Available in one, two or three drum sizes with line pulls up to 21,000 lbs. and line speeds to 400 fpm. Write today for complete information.

On Pittsburgh's fabulous "Golden Triangle" project, Clyde Band Friction Hoists again prove their ability to spot loads swiftly, accurately, and safely. Where building schedules are tight, where material handling costs are paramount, contractors know they can depend on Clyde equipment.

Preference for Clyde hoists is based on these performance advantages: Smooth, positive clutch engagement and release . . . elimination of shock loads . . . split-second control for fast, accurate spotting . . . internal friction bands that dissipate heat faster, last longer, are quickly adjusted and that can be replaced without removing the drums . . . ball and roller bearings throughout results in greater operating economy and minimizes maintenance.

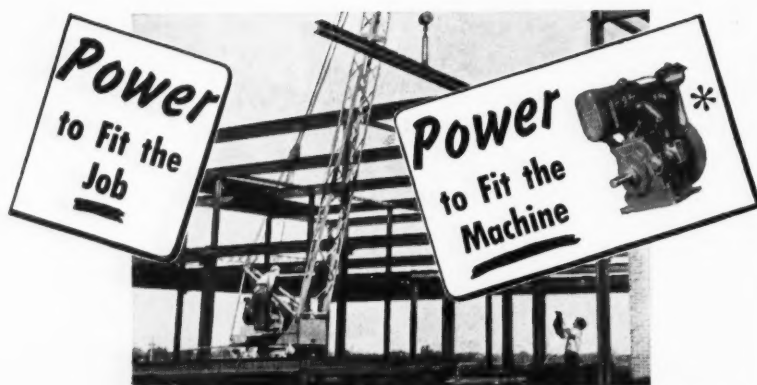


HOISTS . . . DERRICKS . . . CAR PULLERS . . . BUILDERS TOWERS . . . WHIRLEYS . . . ROLLERS . . . HAND-CRANES

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DULUTH 1, MINN

Subsidiary of Barium Steel Corp.



WISCONSIN-Powered STEEL DERRICK

Clyde Iron Works, Inc., Duluth, Minn., builds this Model W3 Whirllette, powered by a Model AHH Wisconsin single cylinder Air-Cooled Engine. Hook work capacity: 10,000 lbs. at 10 ft. radius; 2,000 lbs. at 40 ft.; hoist line speeds, 50 to 160 f.p.m.; boom lengths, 20, 30 or 40 ft. Requires no guy wires or stiff legs; turns through 360°.

Another example of "Power that Fits the Machine and Fits the Job" . . . designed and built for heavy-duty service, delivering maximum torque at usable speeds for equipment that really has to go to work. And dependable AIR-COOLING takes care of cooling problems under all weather and climatic conditions.

You can't do better than specify Wisconsin Heavy-Duty Air-Cooled Engines for your equipment . . . single, 2- and 4-cylinder models, 3 to 36 hp.



WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46, WISCONSIN



CINDER SPREADER—Latest addition to the line of Hercules truck-mounted spreaders is this cinder spreader that's completely controlled from the driver's cab. Precision-control baffles adjust to any spread pattern for full-road or half-road coverage and keep cinders from scattering and hitting other vehicles. Bolt-on deflector plates permit easy replacement of worn baffles. Conveyor and spinner mechanism are powered by a truck-transmission-type power takeoff through a universal joint and protected drive line. A heavy-duty gear reduction box completes the basic speed to power changeover. A pre-heater uses the truck exhaust heat to prevent large, wet chunks of cinders from forming next to the conveyor chain in the body. This assures constant, uniform spread. Standard sizes of the semi-sloped hopper bodies are 5 and 9 cu yd and are 11 ft long. Other sizes are available on special order.—Hercules Steel Products Corp., Galion, Ohio.

Proven Dependability

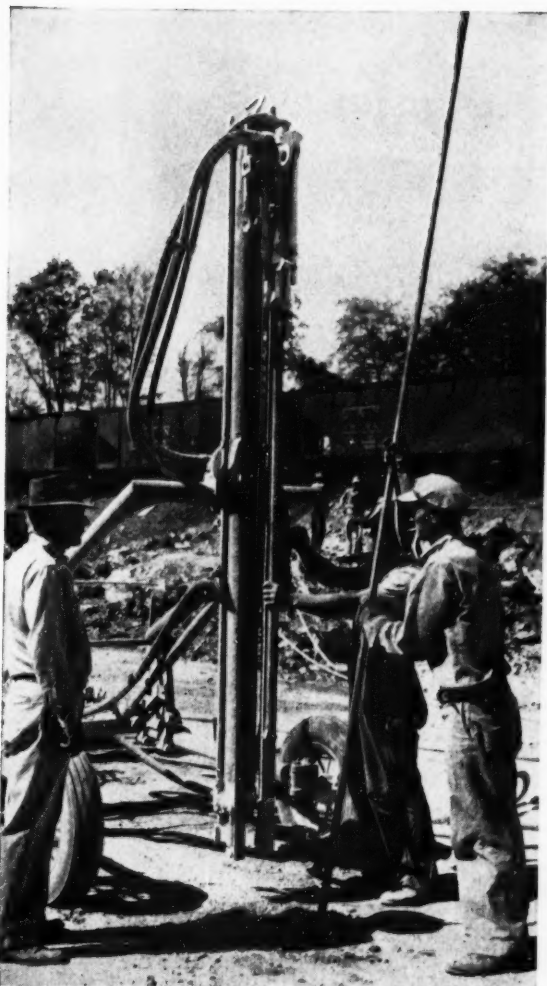


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VULCAN IRON WORKS • 329 NORTH BELL AVENUE • CHICAGO 12, ILL.

SEALER PROVIDES PROTECTIVE COATING—Anyone who has tried to paint over asphalt, coal tar, mastic or Gilsonite coatings has undoubtedly experienced bleeding, staining, lifting, wrinkling or any combination of the four. Now, according to the manufacturers, a new sealer permits painting of these materials by providing a protective coating. It is Prufcoat Sealer P-25M, and it has proved its worth in several different applications. The interior structural steel in a midwest acid plant had been painted with a black, coal-tar paint. When renovation took place the owner decided on white paint to improve lighting conditions. After applying one coat of P-25M over the coal-tar paint and allowing the sealer to dry for an hour, workmen applied corrosion-resistant Prufcoat BX white enamel without any bleeding or staining. A major chemical producer has standardized on the use of Prufcoat painting in tank cars. Another manufacturer has used the sealer-enamel combination successfully in painting over black mastic insulating material on masonry walls. The company has an interesting booklet which describes the product completely.—Technical Bulletin No. 023. Write to G. Russell Hersam, Prufcoat Laboratories, Inc., 50 E. 42nd St., New York 17, N. Y.



LONGER STEEL, COMING UP!—In drilling some 750,000 ft of blast holes in limestone, the contractor has relied largely on hard-hitting wagon drills to put down holes as deep as 24 ft—using detachable bits on rods of Bethlehem hollow drill steel.



ON THE FIRING LINE—(left to right) E. T. (Hap) Houlihan, Mgr., Contractors Service and Supply Co., Winchester, Ky. His firm supplies and reconditions the Bethlehem hollow drill steel. Next is Alex Manson, L & N Engineer in charge of the project; John Callaway, Project Sup't, Codell Construction Co.; Casey Jones, Drilling Foreman for Codell.

Moving 1 million cu yd of rock for railroad yard at Nashville

The job of tearing up and moving 2½ million cu yd of material—about half of it rock—is nearing completion at Nashville, Tenn., where a modern and greatly enlarged freight yard is taking shape. It will serve the combined needs of the Louisville and Nashville Railroad and the Nashville, Chattanooga and St. Louis Railway.

When completed, the Radnor yard will accommodate 6,576 cars—more than double the existing capacity. The project includes the most modern facilities for servicing locomotives and cars, fast communications systems, 90 miles of additional tracks and other improvements to speed the forwarding of cars.

Excavation and grading contracts are held by Codell Construction Co., Winchester, Ky., and Oman Construction Co., Nashville. Using detachable bits on rods of Bethlehem hollow drill steel, Codell has drilled about 750,000 ft of hole in medium-hard limestone. Grading and structures are slated for completion in April.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation



BETHLEHEM HOLLOW DRILL STEEL



THE MIGHTY 225 H.P. DIESEL POWER PLANT in this big GMC 970-67 will hustle capacity loads any place the truck can go. Easy-shifting Synchro-

Mesh Transmission and recirculating ball-bearing steering make this brawny GMC easy to handle—even in the tightest spots.

The tougher the job, the more you need a GMC Diesel



EVEN TOUGH GOING LIKE THIS is no match for a GMC Diesel. A third differential in the power divider sends each of the drive wheels just the power it needs—despite irregularities in tire wear or terrain. No more power waste or tire fight! But an optional* differential lockout operating from the dash lets you pour full and equal power to all four wheels when demanded by ice, snow or muddy going.

*Optional, at extra cost.



DIESEL TRUCKS 19,500 GVW to 100,000 GCW

ONLY GMC's hard-slugging Diesel six-wheelers deliver the *two-way* performance you need for tough on-and-off-the-highway Diesel hauling—all the way up to the 63,000 GVW-100,000 GCW range.

The unmatched smoothness of their 2-cycle Diesel power hustles capacity loads over the highways in schedule-bettering time. And at the job site, they can pour on mighty reserve to wrestle through the slickest mudholes, the rockiest pits—or up the most murderous grades.

Year after year, a GMC Diesel will stand up to the roughest conditions you'll ever meet—because super-stamina is engineered in—right down to the bolts and rivets. So you'll find GMC maintenance is surprisingly low. *And your fuel bills will be a fraction of comparable gasoline costs.*

Your GMC dealer has all the facts and figures. Drop by and find out why America's first-choice Diesel truck should be *your* choice for the next tough job!

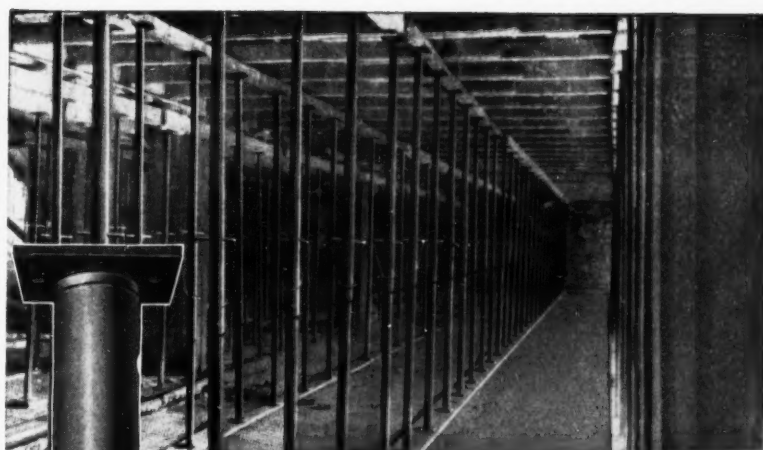
GMC Truck & Coach Division of General Motors



MASONITE SIDING IN THREE WIDTHS—Masonite siding in 8-, 10- and 12-ft lengths and in widths of 12, 16, or 24 in. is now being produced for lap siding, especially in the new ranch-type houses. Offered pre-cut and packaged for the first time, the material provides uniformity, smoothness, extra width and durability. The siding has proved to be resistant to all types of weather, is said to be tougher than oak, and has high impact and abrasion resistance. It is grainless, therefore won't split, splinter or crack. The Masonite siding comes in two thicknesses, $\frac{1}{4}$ and $\frac{5}{16}$ in., and can be provided with a newly designed shadow strip. Like the other Masonite products, (the siding is made of Tempered Presdwood) it has high paintability.—Masonite Corp., 111 W. Washington St., Chicago 2, Ill.



BLOCRETE—Blocrete is the name given to the method of applying vermiculite concrete through an air hose. The successful use of this air-placed lining for fireproofing a hotel elevator shaft was reported earlier this month by the manufacturer. As the plasterers worked their way up the 7-story shaft they applied a $3\frac{1}{2}$ -in. coating over reinforcing. On the descent an additional $\frac{1}{2}$ -in. coat was



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It will pay every contractor to replace out-moded shoring equipment with the New MARVEL Adjustable Prop with "Premium Performance" because only the New MARVEL has the Completely Encased Adjusting Screw built for Life Time Service.

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Available in three sizes . . . Maximum Adjustment to 15 feet.

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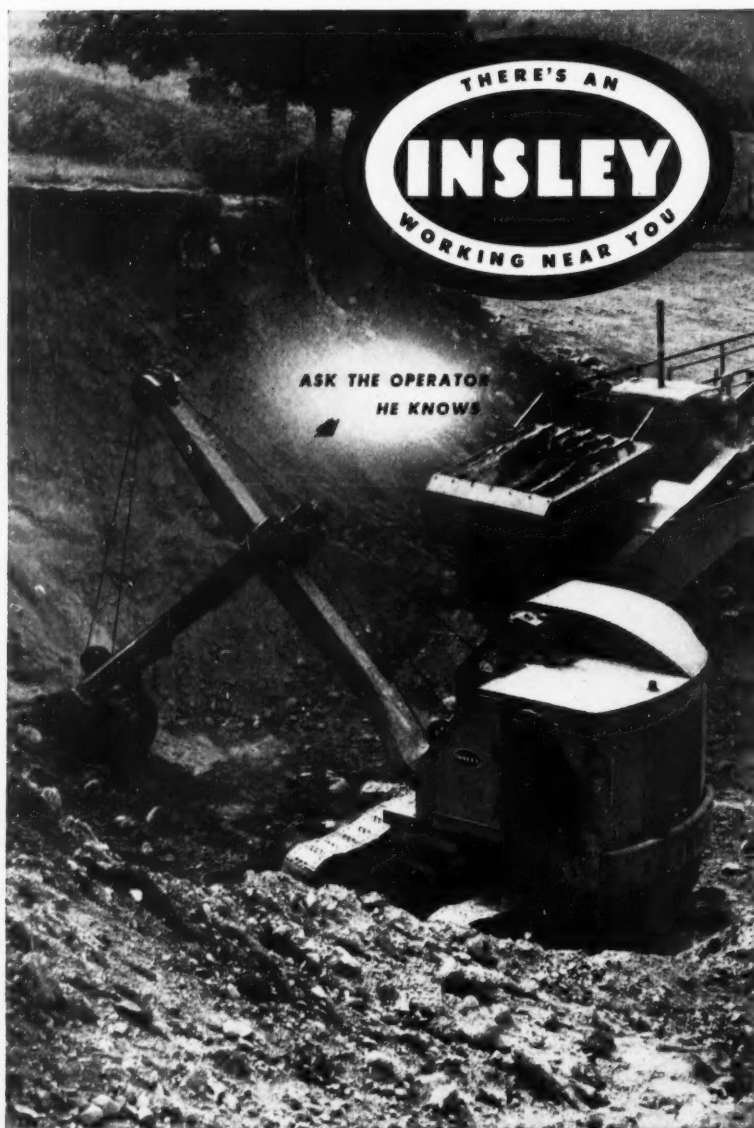
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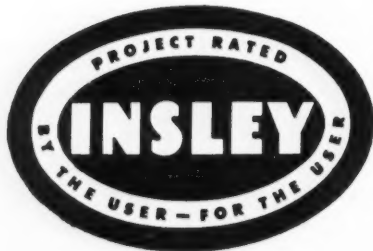
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applied, and its surface was smooth enough to preclude any troweling. The concrete met fire ratings because vermiculite aggregate is incombustible and resists the spread of flames. In this particular installation—in the Spokane Hotel in Spokane, Wash.—elimination of forming not only saved a tremendous amount of money and time, but also permitted use of the hotel stairway throughout the operation. The wall adjoining the stairway is supported on the same studs as one wall of the shaft and, since it is decorated with wallpaper and wood trim, would have had to be replaced at a good deal of expense. Central Construction Co. was general contractor. Its men set all reinforcing, corner angles and cross-members. The Bloccrete job was sublet to R. I. Montelius Co. and completed in 10 days. All firms are headquartered in Spokane.—**Zonolite Co., 135 S. LaSalle St., Chicago 3, Ill.**

WOOD PREPARIZER; SOIL BLENDER—The Wood Model P-600 Preparizer scarifies and pulverizes old asphalt mats for 100% re-use in one operation. It can handle mats up to 6 in. deep through a 6-ft wide panel, and has a capacity up to 1,500 sq yd per hr. Aggregate is returned to its original size and in one to three passes. The P-600 is designed to re-process any asphalt material that can be scarified by a motor grader. The company now offers an attachment which converts it into a soil blender whenever needed. The machine will blend different types of soil with water into a homogenous mass to depths up to 24 in. loose or 12 in. compacted. An International Harvester UD24, 180-hp diesel engine replaces the previous power plant, representing an increase of 55 hp over the former engine. In addition, drive-on paddles replace the old time-consuming method of bolting paddles to the rotor shaft. **Wood Mfg. Co., P. O. Box 620, 6900 Tujunga Ave., N. Hollywood, Calif.**

HYDRAULIC PUMP POWERS SAFETY RAM — Ohio hydraulic pumps are operated by an ordinary air line, and can be used directly with any type of cylinder, ram press or jack. They've been designed for continuous service at maximum capacity without fear of overloading or overheating, according to the manufacturer. The pump is adaptable to many installations, weighs only 35 lb, and can be moved about easily on four casters. A companion product is the Ohio Safety Ram which unloads itself automatically to prevent any plunger pop-out. They are available in 20-, 35- and 70-ton capacities. Both pumps and rams are made under exclusive license by **Powermatic, Inc., 1944 E. Market St., Akron 5, Ohio**

What Top-Notch Street and Road Construction Men Say About *the* **SEAMAN MIXER**



The Seaman Self-Propelled TRAV-L-PLANT 7 ft. mixing width, gasoline or diesel-powered. Equipped with pump, full tachometer assemblies, volumetric meter (optional) and spray bar for bituminous, tars, oil, emulsions.

Ingham County, Mich. engineer says: "We are mixing scarified oil mat on 90 miles of road with the Seaman Mixer and are finishing a mile a day. Incidentally, we use the Seaman to mix in calcium chloride on a number of our roads which effectively prevents frost-boils."

In an article in Public Works Magazine, Robert Bailey, City Manager, Chico (pop. 12,500) writes: "For roadmixing lime stabilized seal coated streets, we have used a Seaman Mixer very effectively."

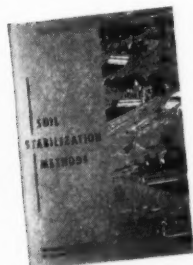
These reports are conclusive proof that—in the construction of your city streets and your state and county highways—The Seaman Mixer provides greater daily output of high quality mix at savings up to 40%. So, put a Seaman on your equipment list this season.

Calgary, Alberta, reports that in the construction of city streets, parkways and parking lots, plus 115 miles of asphalt roads, 110 miles of gravel stabilization and 297 miles of oil-gravel mixed roads—all with the Seaman Mixer—they mixed from 230 to 345 tons per hour and finished at least one mile and sometimes two miles a day. The road widths ranged from 18 to 20 ft.

Reno County, Kansas, highway officials report a saving of \$210 per mile in road maintenance with the Seaman Mixer.

Again, in Public Works Magazine, R. E. Gahan, City Engineer, Merced, Cal. (pop. 16,000) writes, "Most effective use of equipment was the construction of some 80 blocks of road-mixed re-surfacing work with the Seaman Pulvi-Mixer."

Another Kansas County reports that in using the Seaman Mixer they released one of two motor patrols for other work, found a 40% saving in cost and built a 100% better quality road.



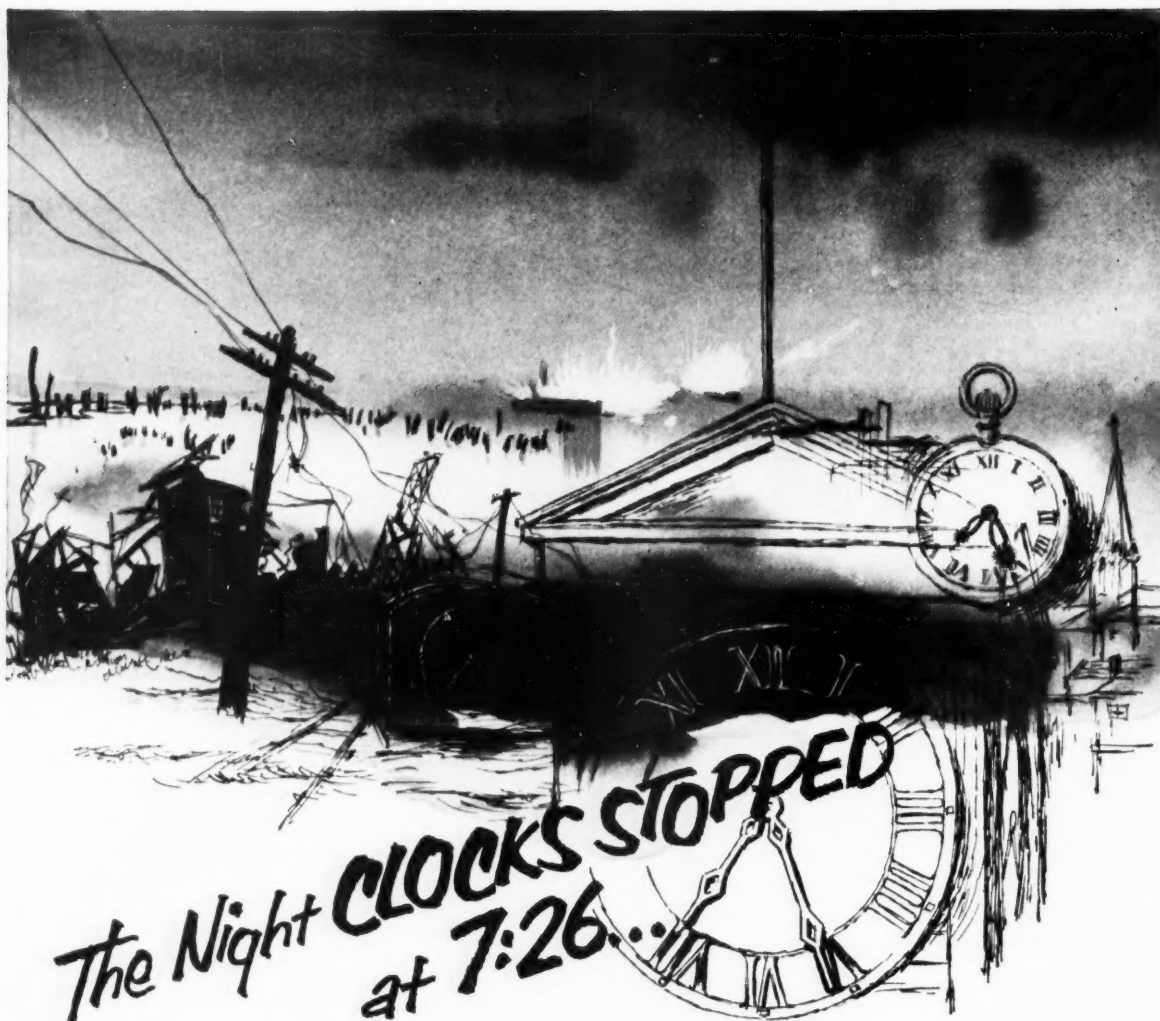
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Some 9,500 people were in South Amboy, N. J., that drizzly evening in 1950. At the waterfront, longshoremen were transferring the last of 12 freight cars of ammunition to lighters that would carry it to a waiting vessel in Raritan Bay.

But the City Hall clock never got to 7:27—and the freighter's deadly cargo never got loaded. Explosions shattered windows over a

radius of 12 miles; and hundreds of people looked at their arms and legs and saw that flying daggers of glass had stabbed them.

At dawn, 312 of the injured had been counted.

★ ★ ★

Such disasters have happened many times before in America. They could happen again. And if they do—and *when* they do—there must be blood plasma on hand to take care

of the injured. For blood saves lives!

But blood cannot be mined or manufactured. It must come from the veins of healthy men and women. Men and women who feel concern for a suffering neighbor. So give blood—now!

Whether your blood goes for Civil Defense needs, to a combat area, or to a local hospital—this priceless, painless gift will some day save an American life!



**Give
Blood
Now**

**CALL YOUR
RED CROSS TODAY!**

National Blood Program

Business Executives!
✓ Check These Questions!

If you can answer "yes" to most of them, you—and your company—are doing a needed job for the National Blood Program.

- ☐ Have you given your employees time off to make blood donations?
- ☐ Do you have a Blood Donor Honor Roll in your company?

- ☐ Have you set up a list of volunteers so that efficient plans can be made for scheduling donors?
- ☐ Have you arranged to have a Bloodmobile make regular visits?
- ☐ Has your management endorsed the local Blood Donor Program?
- ☐ Have you informed employees of your company's plan of co-operation?

- ☐ Was this information given through Plant Bulletin or House Magazine?
- ☐ Has your company given any recognition to donors?
- ☐ Have you conducted a Donor Pledge Campaign in your company?

Remember, as long as a single pint of blood may mean the difference between life and death for any American . . . the need for blood is *urgent!*

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Galion Model 700 hydraulic hoist with Model 12 contractors' heavy duty body.

► If you need dump truck equipment that is built to take a beating day after day without downtime . . . that will work longer with less maintenance and operating cost . . . that you can be proud to own and operate . . . you should become a Galion user—right away!

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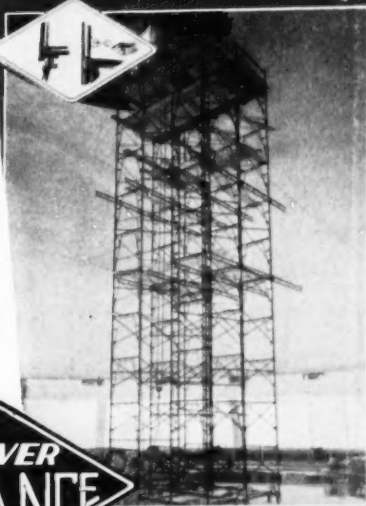
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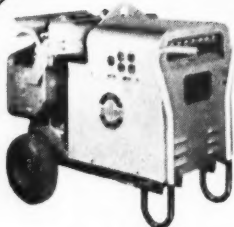


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A combination power plant and arc welder that you can take right to the job . . . regardless of where you are working . . . you will have power to operate tools, other equipment, lights—and at the same time an arc welder to do those welding jobs. The only welder of its kind on the market today . . . compact and portable . . . its exclusive features warrant your immediate investigation.

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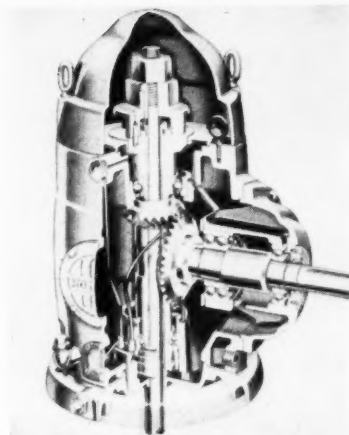
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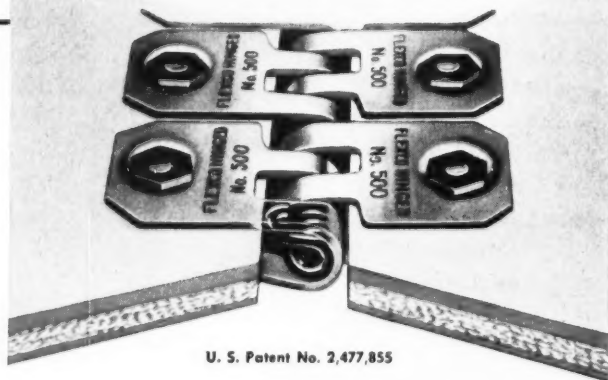


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RIGHT-ANGLE GEAR DRIVE—A right-angle gear drive has been developed for operating deep well pumps in locations where electricity may not be available or where gas can be used more economically for power. The right-angle gear drive permits use of gas, diesel or gasoline-engine power and is in full production to 70 hp. Called U. S. Holloshaft, the drive provides constant cycling of oil, visible through a "Lubripeek" window and flush-style "Visolube" oil gage. The top thrust bearing can be removed easily without disturbing the hollow shaft or gears. A reverse protection clutch prevents the pump shaft from becoming unscrewed in case of torque reversal. Built-in backstops prevent the pump from back-spinning. Tandem mounting of thrust bearings can be arranged to give higher thrust ratings for extra deep pump settings or where large water volume is delivered. An internal water-cooling jacket keeps down the temperature of the sealed oil.—U. S. Electrical Motors, Inc., Box 2058, Los Angeles 54, Calif.

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- ✓ For joining grader, trencher, ditcher and other earth moving conveyor belts.
- ✓ For belts $\frac{3}{8}$ " to $\frac{1}{2}$ " thick.
- ✓ A FLEXCO fastener that is HINGED. Has removable hinge pin.
- ✓ Troughs naturally, operates through take-up pulleys.
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VACUUM SWITCH—Designed for use with either electric motors or gasoline engines, the Vac-On switch is a vacuum switch that shuts off power source when liquid supply runs dry. It has innumerable industrial, marine and manufacturing applications where safety of equipment depends on suction-delivered lubricants, fuel, water, etc. The switch mounts on a suction line and is wired into the power supply or spark system on motors or engines, respectively. When suction falls below a predetermined negative pressure (approximately 1 in. of mercury) the switch goes into action. Electric motor models will work on motors up to 2 hp, ac and $\frac{1}{2}$ hp dc. Gas engine model will short out the spark plug on any size gas engine. A hand lever is provided for manual restart.—Jaycon Associates, 404 N. Washington Ave., Minneapolis, Minn.



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Smaller areas, around
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Largest area is 2' long
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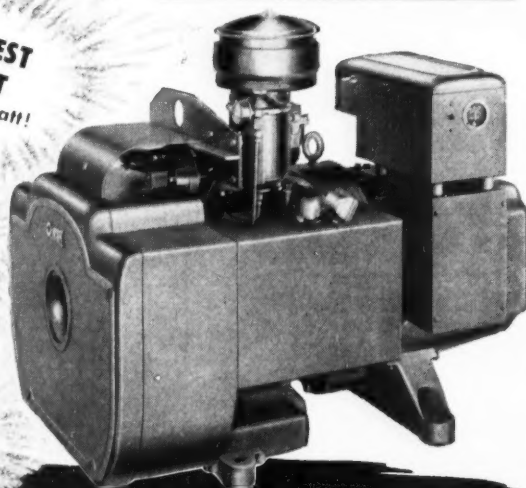
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Designed to fit every application better . . . standby, portable, mobile and stationary. Whatever your need for electric power, the new Onan CW-5 and 10 give you top performance and value!

Here for the first time are 5 and 10KW electric plants powered by revolutionary, new air-cooled gasoline engines, designed and built by Onan exclusively for electric plant use!

Both engines are 1800 R.P.M. The 13HP Onan engine which powers the CW-5 and the 20HP Onan engine used for the CW-10 weigh much less than general-purpose engines, and are amazingly compact. Built to deliver dependable, trouble-free service in heavy-duty use. Two-cylinder, alternate-firing design assures smooth, vibration-free power. New, quiet, highly-efficient vacuum air cooling drives out all heated air through one side duct. The same duct carries exhaust gases, simplifying installation.

Impulse-coupled, high-tension magneto ignition for quick starting under all conditions. Both models in all standard voltages 60-cycle A.C., single or three phase.

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NEW EQUIPMENT BRIEFS

Most space heaters have electric-driven blowers and therefore can be used only where electricity is available. A new type made by **Quiet Automatic Oil Burner Corp.**, 33 Bloomfield Ave., Newark, N. J., has a small gasoline engine to do the job on 200,000- and 400,000-Btu sizes.

A retractable reel for electric cable, labeled the Spring-O-Matic Power-reel, can handle up to 150 ft of multiple conductor cable up to No. 4 and can be mounted on floor, ceiling, right or left wall. A gasket-sealed housing protects the collector ring against dirt and moisture. It's fine for mounting in compartments on trucks or mobile units, according to the maker, **Industrial Electrical Works**, Dept. 36A, 1505 Chicago St., Omaha 2, Neb.

A new 20-ft long, 20-cu yd package trailer dump has been put on the market by **The Galion Allsteel Body Co.**, Galion, Ohio. Dumping is done by a Galion 77380 hoist, consisting of two 3-section telescopic units, rated at 22 tons. The unit is Heavy-Duty Model 12 and is available with power fifth wheel or hose operation. Several optional tire sizes and brakes can be had.

Dimetric graph sheets join the Instrumaster line of isometric and dimetric ellipse stencils to promote axonometric drawings. They come in pads of 50 sheets each and the lines, although light enough not to reproduce on blueprints or black-and-whites, can be readily traced. Sample sheets will be sent upon request on company stationery by **John R. Cassell Co., Inc.** 110 W. 42nd St., New York 36, N. Y.

A new line of **Ball-Rite drills** is available from representatives of **Cummins-Chicago Corp.**, 4740 N. Ravenswood Ave., Chicago. They have been under test for six years, according to the company, and are said to be equal in performance and durability to industrial drills selling in a range one third higher.

Originally developed for the Navy by **Universal Mfg. & Sales Co.**, 5211 Pacific Blvd., Huntington Park, Calif., a self-contained paint shop is now on the market. Set up on a 4-wheel trailer for towing behind a truck, it has a 35-cfm compressor driven by an 8-hp, air-cooled motor. Two 10-gal paint tanks are standard, but may be replaced by 20- or 30-gal tanks. Air and fluid are carried through 100-ft hoses wound over reels.

No guesswork in Minnesota

In Minnesota . . . where normal annual temperatures often range from nearly 100 degrees to a rugged 20 below . . . construction men have discovered how *air entrainment* helps to produce concrete that resists the deteriorating effects of extreme and highly variable temperatures.

But they also know that guesswork doesn't go when you're mixing air-entrained concrete! That's why the State of Minnesota specifies that on Minnesota highways . . . as on so many other construction jobs . . . it's wiser to follow the "prescription" technique.

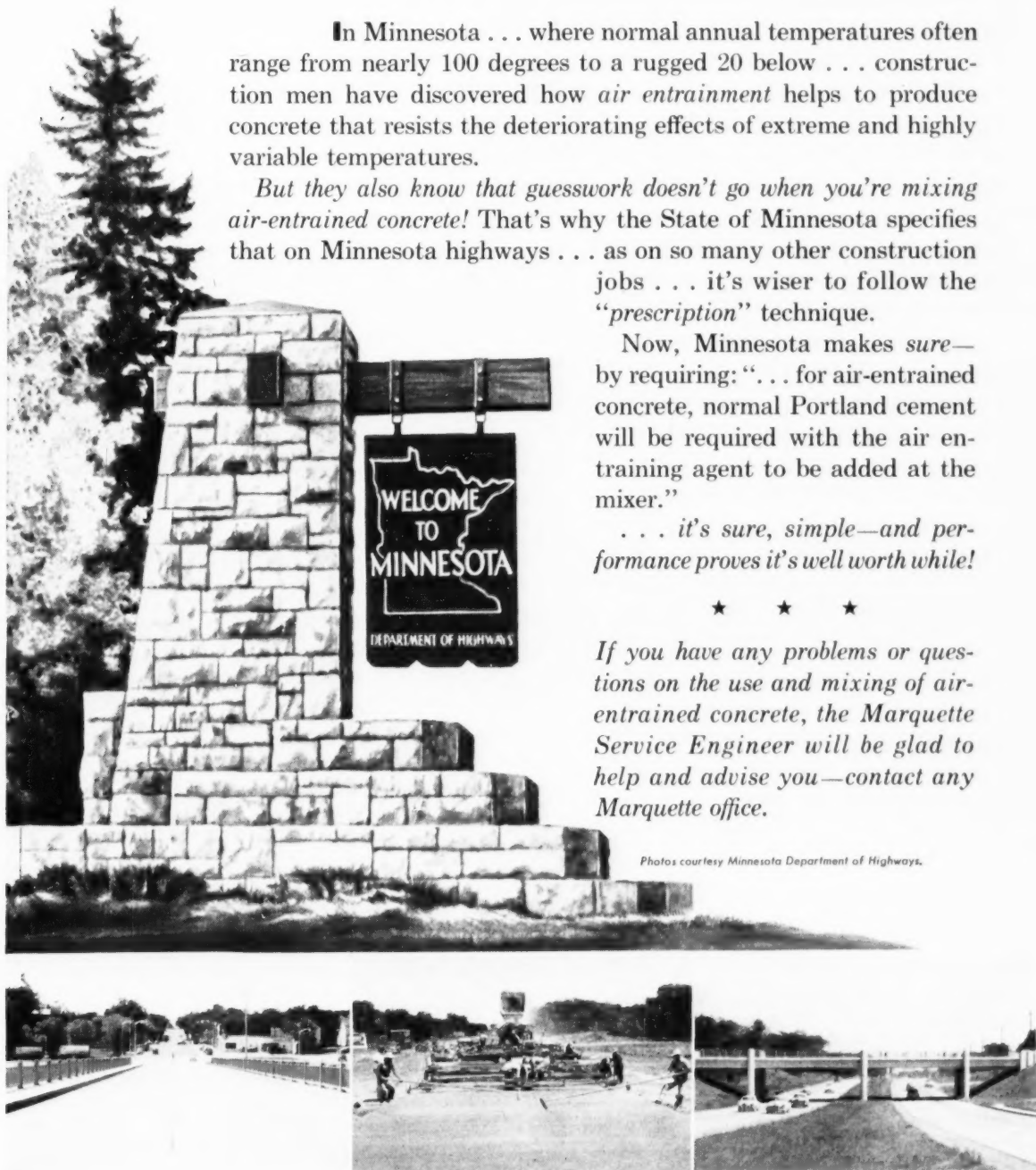
Now, Minnesota makes *sure*—by requiring: “. . . for air-entrained concrete, normal Portland cement will be required with the air entraining agent to be added at the mixer.”

. . . it's sure, simple—and performance proves it's well worth while!

★ ★ ★

If you have any problems or questions on the use and mixing of air-entrained concrete, the Marquette Service Engineer will be glad to help and advise you—contact any Marquette office.

Photos courtesy Minnesota Department of Highways.



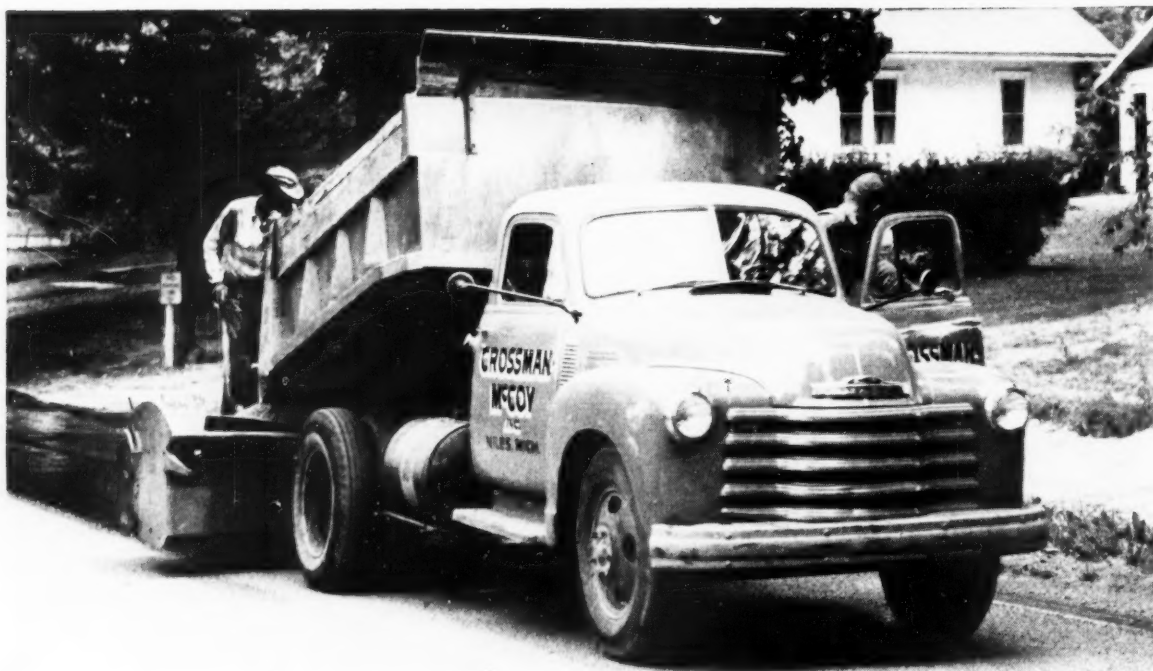
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4 powerful reasons why 1953 CHEVROLET Advance-Design Trucks give you more of what you want

MORE POWER—GREATER ECONOMY! Expect a wonderful advance in power, performance and economy in Chevrolet heavy-duty trucks! The great 1953 Loadmaster engine—standard on 5000, 6000 Series, heavy-duty and forward control models, optional on 4000 Series heavy-duty trucks—has a new high compression ratio of 7.1 to 1, develops even more horsepower than before. And the Thriftmaster engine in light- and medium-duty models brings you traditional Chevrolet economy.

TRUCKS ENGINEERED FOR YOUR PAYLOADS! Chevrolet trucks are designed for the job they will do—engineered from tires to axle, springs, clutch and power plant to do that job with the greatest efficiency and lowest cost. You don't waste money on too heavy a truck or too light a truck. You buy the *right* truck for *your* job!

MORE STAMINA! More strength where strength counts most! In 1953, all Chevrolet trucks have stronger, brawnier, more rigid frames. They have heavier, sturdier construction that means a longer, lower-cost life for your truck. And they have new larger, safer, longer lasting brakes on many models, too!

GREAT TRUCK FEATURES! In addition to the many *NEW* things you'll find in these 1953 Chevrolet trucks, you'll also find many great features yet unmatched by other makes of trucks. Features such as Flexi-Mounted Cabs, Unit-Designed Bodies, Ball-Gear Steering and many others help make Chevrolet Advance-Design trucks your greatest buy. Chevrolet Division of General Motors, Detroit 2, Michigan.

CHEVROLET ADVANCE-DESIGN TRUCK FEATURES

TWO GREAT VALVE-IN-HEAD ENGINES—the Loadmaster or the Thriftmaster—to give you greater power per gallon, lower cost per load. **POWER-JET CARBURETOR**—for smooth, quick acceleration response. **DIAPHRAGM SPRING CLUTCH**—for easy-action engagement. **SYNCHRO-MESH TRANSMISSION**—for fast, smooth shifting. **HYPOID REAR AXLE**—for dependability and long life. **TORQUE-ACTION BRAKES**—on light-duty and medium-duty models and on front of heavy-duty models. **TWIN-ACTION REAR BRAKES**—on heavy-duty models. **DUAL-SHOE PARKING BRAKE**—for greater holding ability on heavy-duty models. **CAB SEAT**—with double deck springs for complete riding comfort. **VENTI-PANES**—for improved cab ventilation. **WIDE-BASE WHEELS**—for increased tire mileage. **BALL-GEAR STEERING**—for easier handling. **UNIT-DESIGNED BODIES**—for greater load protection. **ADVANCE-DESIGN STYLING**—for increased comfort and modern appearance.



Haskelite Mfg. Corp., Grand Rapids 2, Mich., has introduced its **K-D packaged flush door**, complete in one package. Door is drilled for the lock, butts are installed on the door and frame, jambs are notched for the header and trim is mitered. Six standard sizes range from 1 ft 6 in. to 3 ft in width.

Safe-I-Weld is the name given a new welding helmet made from glass fibers by **U. S. Safety Service Co.**, 1215 McGee St., Kansas City, Mo. It's highly resilient and will not split, crack or deform. It has a patented hinge which locks the helmet in raised or working position and is adjustable to any head size.

A new line of small, **portable arc welders**, powered by the company's simplified diesels is available from **R. H. Sheppard Co.**, Hanover, Pa. Said to be the first arc welders of 200-, 300-, or 400-amp capacities powered by diesels, they're built as integral units, mounted on four-wheel trailers (or optionally on steel I-beam skids). Smallest unit, with engine, measures 27½x63½x45¾ in. high.

Waterbury Tool, Division of Vickers, Inc., Waterbury, Conn., announces a series of ten **heavy-duty, variable-delivery hydraulic pumps**. Units have capacities of from 28 to 2,300 gpm; rated speeds; 50 to 4,000 hp; and pressure ranges from 2,000 to 3,000 psi. Applications include winches and hoists, drawbridge lifts, machine drives, etc.

Explosives-actuated chopper, one unit of a diverse group, can cleanly sever bundles of cables 1½ in. by 2¼ in. or fluid lines up to 1½-in. dia. Labeled Model 174-2-A-1, the blade is driven by 38-caliber propellant cartridges. Explosive is ignited electrically from remote location, and safety device prevents premature operation. Maker is **Beckman & Whitley, Inc.**, 994 San Carlos Ave., San Carlos, Calif.

A 48-in. **Aluminedge mason's wood level** is announced by **The Columbian Vise & Mfg. Co.**, 9023 Bessemer Ave., Cleveland 4, Ohio. It's completely enclosed with aluminum on all edges. Vials are enclosed in new type plastic rings for maximum light reflection and less chance of breakage. The company's Form CS-648-AB describes it in full. Contractors and dealers working with insulation often end up a job needing just a few more feet. Anticipating this, **Infra Insulation, Inc.**, of New York City now packs **100-sq ft cartons** as well as the usual 1,000-, 500-, or 250ft units. Cost of installation in new construction between wood beams or studs is claimed to be less than 10¢ per sq ft for material and labor.

500-KW MOBILE UNIT

beats power shortage in rural Minnesota!



THE Rural Cooperative Power Association, at Elk River, Minn., saved a lot of time, work, and money recently, by mounting a complete diesel-powered, 500-KW electric generating system aboard a pair of heavy-duty LaCrosse low-bed trailers. Forced by increasing line loads to boost voltage and convert from single to 3-phase operation, RCPA had to energize many scattered substations serving towns, villages, and farm areas . . . without interrupting vital electric power! Problem was solved by this unique, trailer-mounted unit, complete with 250-gal. fuel tank, and all necessary accessories. Generator rides on giant shock absorbers for safe mobility over rough terrain, while 6 leveling screw-jacks



keep moving parts in perfect alignment when operating. Second LaCrosse low-bed carries spare 500-gal. fuel tank, 325 gals. water for 2 large radiators, and 7 banks of transformers supplying 400, 2400, or 7200 volts, plus lighting. Two trailer units operate as a "team" in RCPA's substation conversion work . . . can also rush emergency power wherever needed. YOU, too, can save money by mechanizing your operations on job-proved LaCrosse Trailers! 85 low-cost models . . . 6 to 67 tons capacity . . . flat, drop, or tilting platforms! Write TODAY!



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New PUBLICATIONS From MANUFACTURERS

The catalogs and bulletins reviewed below will keep you posted on latest developments in construction equipment and materials available for your use.

MAINTENANCE OF UNPAVED ROADS—This is a pocket-size booklet of 36 pp which tells about the use of calcium chloride in maintenance of unpaved roads. Included are sections on how and where it can be used, maintenance objectives, shaping and crowns and binder soil. Illustrations show roads before and after reshaping, with proper and improper crowns, before and after calcium chloride reshaping.—**Calcium Chloride Inst., 909 Ring Bldg., Washington 6, D. C.**

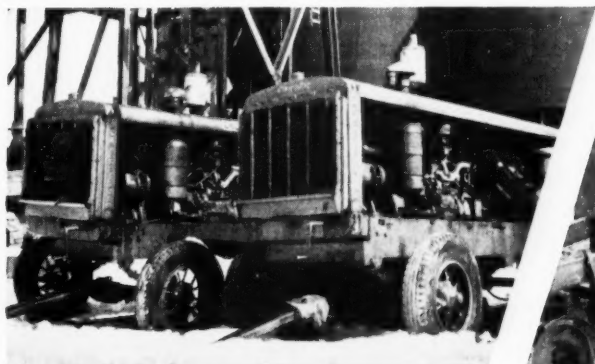
WIRE ROPE—Two booklets, packed with information on wire rope, are available. One, a 64-pager, is entitled "Leschen Wire Rope Handbook"; the other, a 72-pager, is entitled "Use and Care of Wire Rope." The first one is designed to help users become expert wire rope buyers. It contains descriptions, diagrams and illustrations of all the many types available from the company, as well as working loads, lubrication, safety factors and specifications. The second is also pocket-size, and describes proper methods of reeving, splicing, cutting, handling and storing.—**A. Leschen & Sons Rope Co., 5909 Kennerly Ave., St. Louis 12, Mo.**

EARTHMOVING—The articles written by E. O. Martinson, Chief Engineer, Koehring Co., covering crane and shovel operations only, and appearing in this magazine as part of the series, "Earthmoving—An Art and a Science", have been reprinted by the Koehring Co. Reprints may be obtained by writing the **Koehring Co., 3026 W. Concordia Ave., Milwaukee 16, Wis., or The Power Crane and Shovel Assn., 74 Trinity Pl., New York 6, N. Y.**

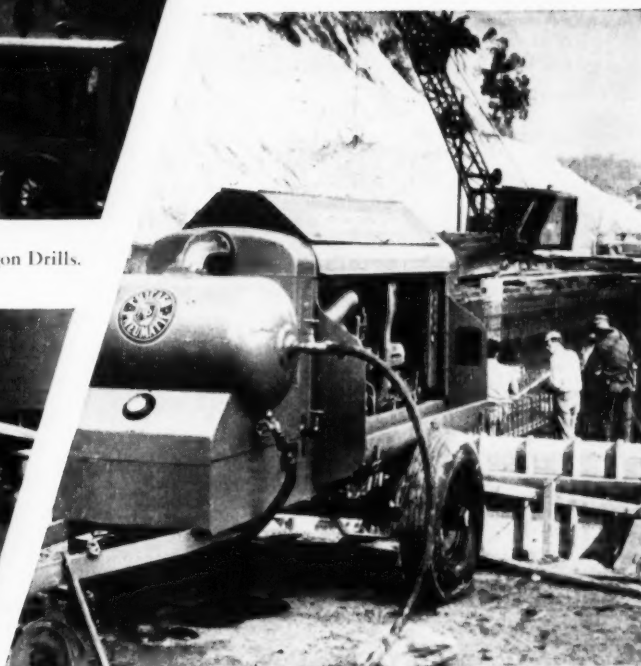
LIFT TRUCKS COMPARISON CHARTS — Two new comparison charts covering both walkie and riding type of electric lift trucks are available. They cover both high-lift and low-lift models and enable a potential buyer or current user to check off items and make an objective point-by-point comparative analysis of other makes with their products. As well as weight and dimensions, brakes and speeds, gear data and aisle requirements, there are questions on power circuits, safety controls, service representation, etc.—**Lewis-Shepard, Dept. R-1, Watertown, Mass.**



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OPEN-WEB STEEL JOIST CONSTRUCTION—This is a 40-p publication of standard specifications for open-web steel joist construction with safe load tables, plates showing dimensions, sections and properties, recommended building code regulations, code of standard practice and recommendations for handling and erecting joists.—**Steel Joist Institute, DuPont Circle Bldg., 1346 Connecticut Ave., N.W., Washington 6, D. C.**

TOTALLY ENCLOSED MOTORS—Explosion-proof electric motors for dangerous, damp and dusty locations is the subject of this color illustrated 8-p booklet. Underwriters classifications, schematic details, and photographs of typical installations are included. Write for bulletin 1784, **U. S. Electrical Motors, Inc., Milford, Conn.**

LIGHTWEIGHT CONCRETE — Lightweight vermiculite and high insulation concrete for floor-slab and floor-fill with illustrations and specifications are contained in this 12-p booklet. General properties and instances of its use are outlined instructively. Send for booklet G-18, **Zonolite Co., 135 S. LaSalle St., Chicago 3, Ill.**

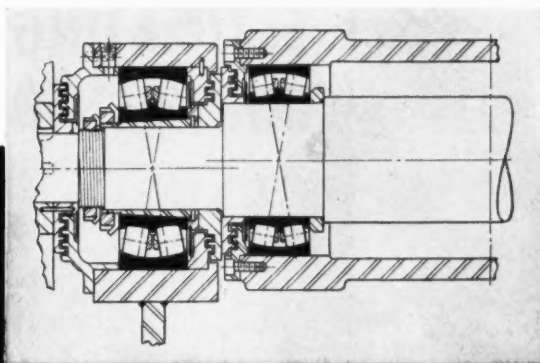
LOCOMOTIVE CRANES—The advantages and special details of torque-controlled locomotive cranes are described in this 16-p catalog. Various features of the cranes are illustrated with dimensions, weights of buckets and capacities listed. Catalog No. 84, **Orton Crane and Shovel Co., 608 S. Dearborn St., Chicago, Ill.**

HOISTS AND DUMP BODIES — Users of dump truck bodies, hydraulic hoists and end-loaders will find this 8-pager handy for selecting the proper equipment for specific needs. Booklet is completely illustrated and has full data on hydraulic hoist specifications. Bulletin L-6512, **Galion Allsteel Body Co., Galion, Ohio.**

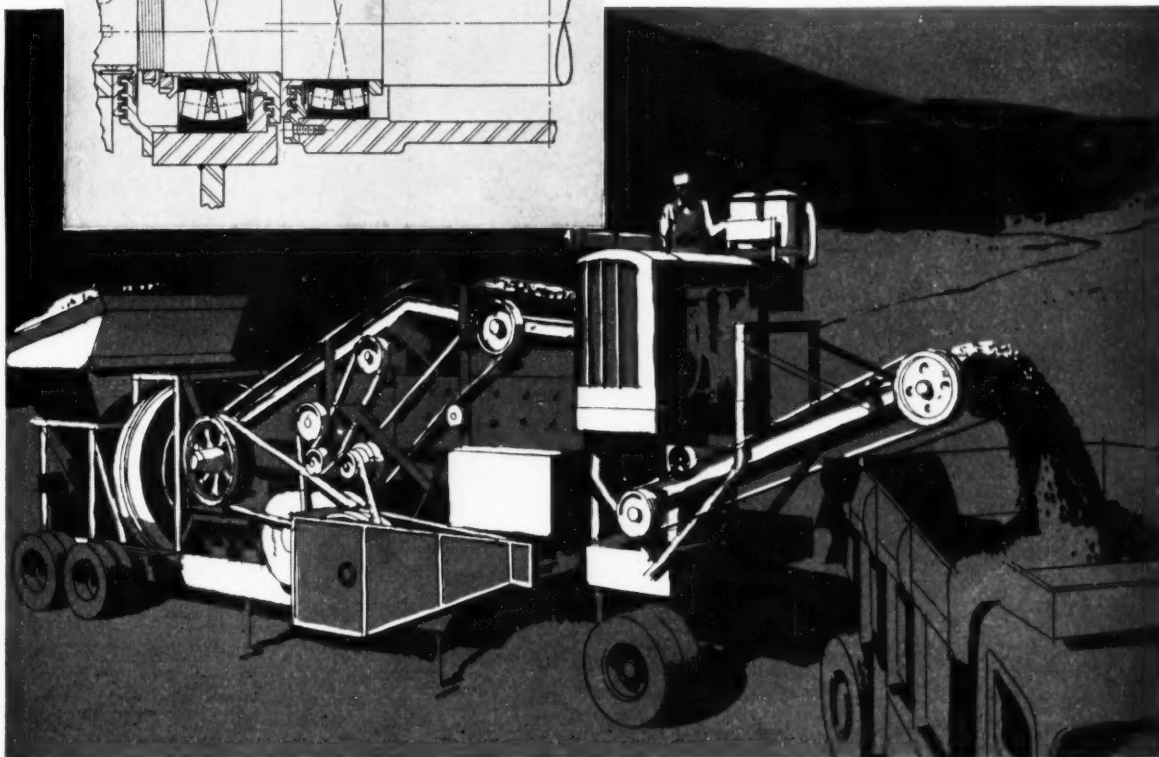
HIGHWAY GUARDRAILS — Safety and simplicity are the subjects of a 4-p folder on flexible metal highway guardrails. High adaptability and low maintenance are illustrated with numerous photographs.—**Flex-Beam Guardrail, Armco Drainage and Metal Products, Inc., Middletown, Ohio**

ROOF INSULATION — Extensive use and wide variety of jobs using it are the basic material of this large fold-up sheet on Fiberglas roof insulation. Under numerous illustrations are lists of jobs with their architects and builders who used the material. Also included is data concerning thermal conductance and application specifications. — **Owens-Corning Fiberglas Corp., Toledo 1, Ohio**

TORRINGTON BEARINGS AT WORK



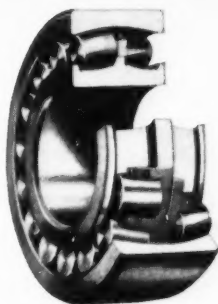
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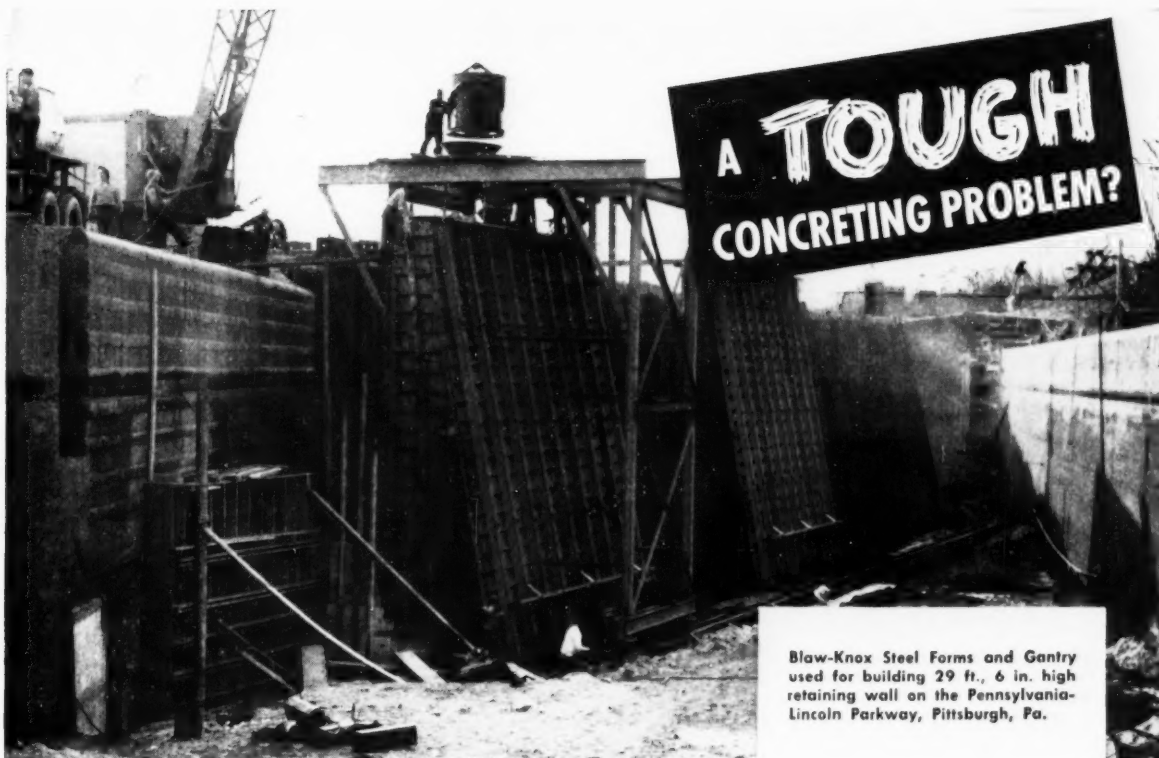
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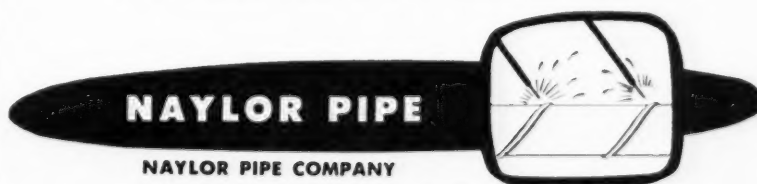
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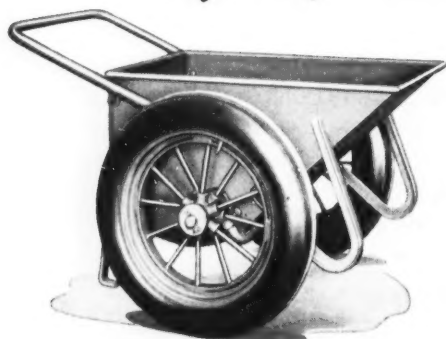
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WHEELBARROWS

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Construction Methods and Equipment's special issue devoted to Construction Equipment Maintenance. The theme will be "Productive Maintenance."

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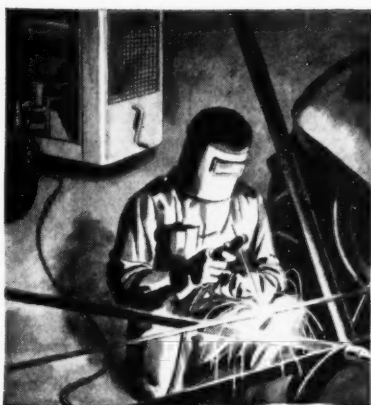
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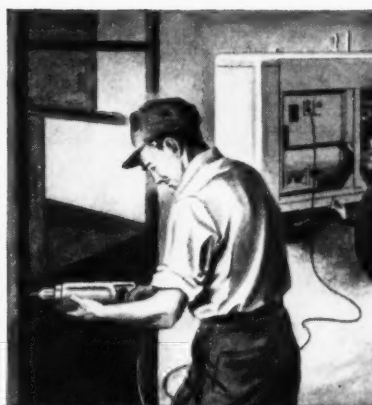
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LIGHT—The auxiliary generator power in this machine is gained at no penalty in weight. The 1,150 pounds represent the lightest possible engine-driven welder with stand-by power that you can buy today. The welder is rated at 200 amperes, full 60-percent duty cycle, NEMA rated, with a maximum of 250 amperes.

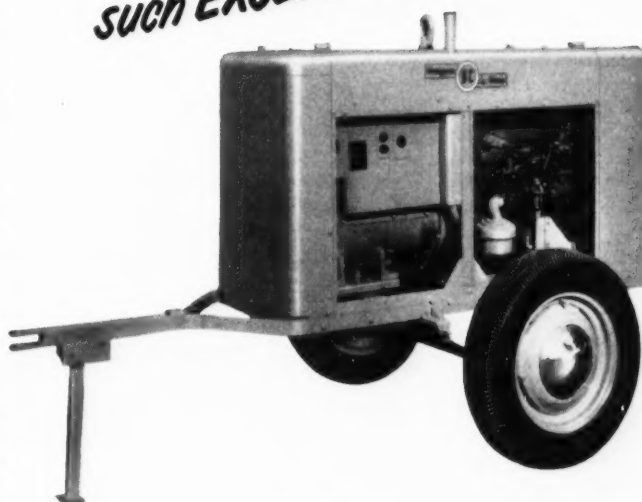
COMPACT—This self-contained unit is only 39½ inches from the base plane to the top of the lifting eye. Its over-all length is 62¾ inches. The welding generator is self-excited and close coupled to the driving engine.

VERSATILE—This welder is valuable in construction and maintenance operations on gas and petroleum pipelines, road-building projects, railroads—in fact at any remote site where there is no access to ordinary power supply. In disaster areas, this welder can power vital electrical equipment until normal service has been restored. The standard unit is skid mounted for truck transport or may be mounted on a high-speed, pneumatic-tired trailer.

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WELDING EQUIPMENT



Methods Memo . . .

TORQUE CONVERTERS are making a fine contribution to improved performance of construction equipment through better control of power flow between engine and driven unit. But sometimes an operator abuses drive-line components because the torque converter permits the engine to turn up full power even under extreme pulling conditions—without low-speed lugging of the engine or stalling it completely. The other day we saw a planetary drive unit that had suffered expensive chewing of the gears apparently due to extreme forcing with big power.

GOOD ADVICE, it seems to us, is contained in this excerpt from an editorial signed by Peter Kiewit and printed in the latest issue of "Kie-Ways," the Peter Kiewit Sons' Co. house magazine:

"For several years we have been on a seller's market. There have generally been more people who wanted to buy than there were items for sale. Some people feel that we started changing from this seller's market to a buyer's market several months ago, and that we are moving in that direction much faster than is generally recognized. I suggest that you keep this in mind in so far as our company affairs are concerned, and your personal interests as well."

A GROUP of highway contractors—in a state that shall remain nameless—became seriously concerned upon learning that their state highway program is threatened by lack of engineers in the highway department. So they cooked up a recruiting spree recently by asking 24

outstanding senior engineering students from various colleges to come down to the state capital at the contractor's expense for a series of interviews with top state highway officials.

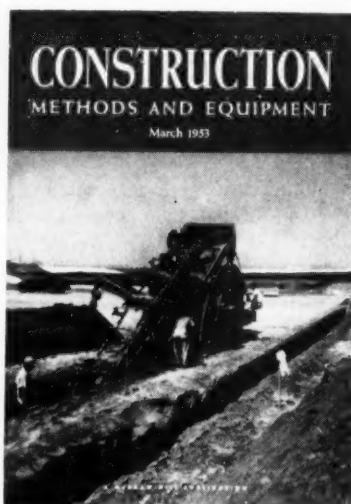
Everything was lovely, the boys were entertained royally, they learned all about the noble profession of highway engineering, and they were deeply impressed by the efforts of the contractors to help them launch a career. Results? Nary a recruit for the highway department, for you see everyone of those boys came away from the conference with an attractive bid from one or more of the contractors that topped anything the poor state could offer.

CONTRACTORS WELCOME the new administration's decision for a review of the federal budget relating to construction. Speaking for his executive committee, Arthur S. Horner, president of the Associated General Contractors of America, said, "We believe that it is sound procedure to examine all public works—and other federal—expenditures, and proceed only with projects which are clearly essential, and to employ on them the strictest standards of economy. This will give further assurance to the public that funds for construction are expended economically."

"We have confidence that sound engineering judgment will be exercised in the review of going and proposed projects, and that the review will be completed promptly so that there will be no delays in executing needed projects and so that advantage can be taken of the full 1953 construction season."

A UNIFORM CONTRACT for municipal engineered construction projects (excluding building construction) is recommended by a joint committee of the American Public Works Association and the Associated General Contractors of America.

The committee also recommends that contractors on municipal jobs be permitted to furnish materials and equipment, that construction should be accomplished under competitive bids, that cost records be kept open to public inspection, that projects and inspection should be under the supervision of a registered professional engineer, and that engineers administering municipal construction be paid salaries matching those paid by private industry for similar work.



On the Cover . . .

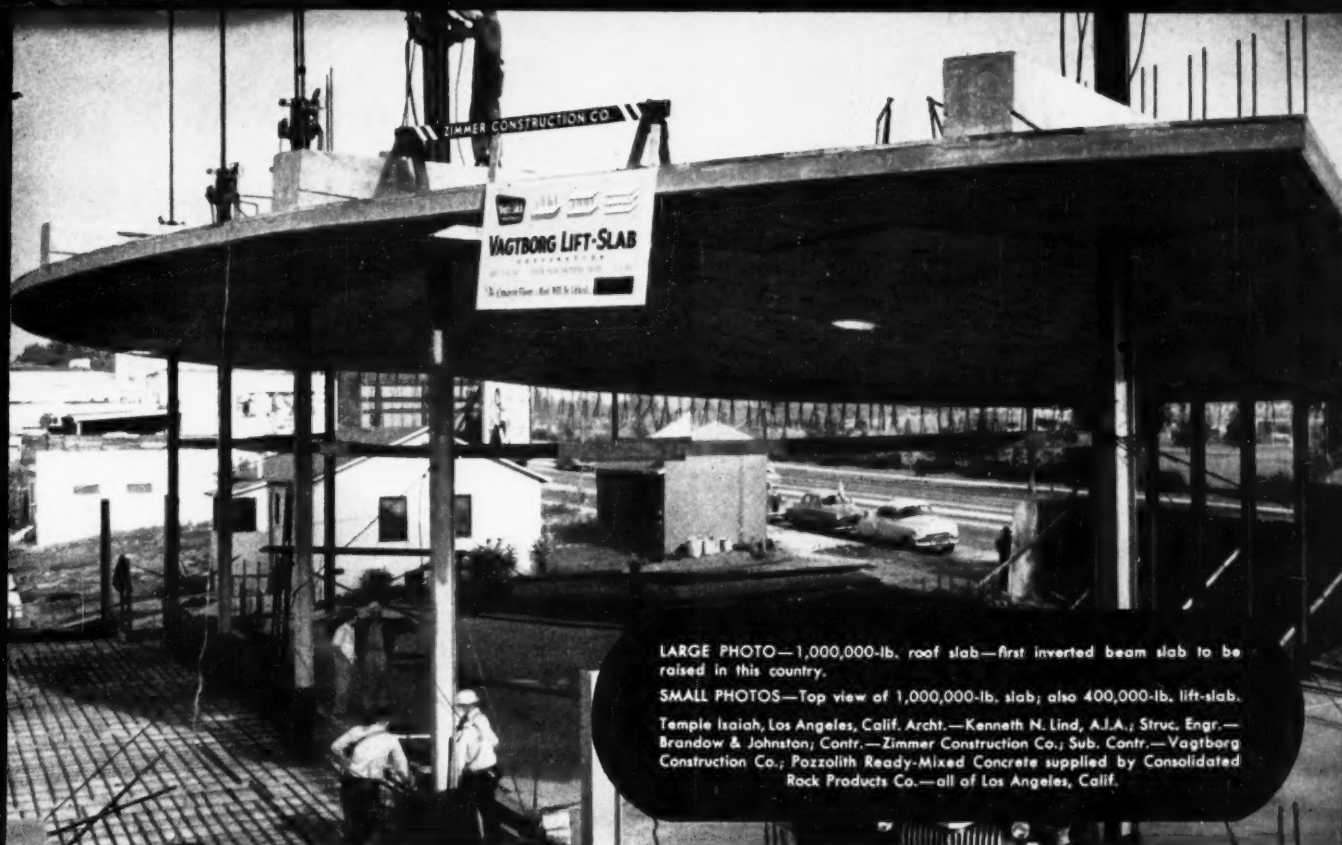
Construction on Newark (N. J.) Airport's new 7,000-ft instrument runway really began buzzing a year ago when public indignation over several airplane crashes in the area caused the field to be shut down. Union Building & Construction Corp., of Passaic, handled grading, drainage and paving with big-production machines. Here Union's Parsons Model 250 Trenchliner is digging utility trenches to service the field. On this job last summer the Trenchliner dug almost 20 mi of trenches at widths of 24 and 36 in. and varying in depth from 2½ to 12 ft. Most of the trench was for a completely new electrical system for the airport, but some of it was put down to receive a 24-in. concrete pipe storm sewer.

FIFTH MAINTENANCE ISSUE

● Look forward to next July, when again you will find "Construction Methods and Equipment" chock full of maintenance information aimed at reducing downtime. Largest single feature will be an Inventory of Maintenance Manuals of more than 300 manufacturers on the operation, maintenance and repair of your construction equipment and accessories. (This feature alone will be worth keeping.) Also we're going to have articles on:

1. Maintenance and adjustment of equipment hydraulic systems
2. Maintenance check sheets and methods used to cover a life of 4,000 hr of a typical machine
3. The care of diesel engines
4. Maintenance and repair of conveyor belts
5. Recapping of tires
6. Maintenance of electrical equipment
7. How one contractor maintains his equipment at his home base and out on the job,

plus dozens of pictures and maintenance tips sprinkled throughout the magazine. Since this extra large issue will be full of information on proper maintenance and repair, you'll want extra copies to give to each of your operators and mechanics. Advance requests have the best chance of being filled. Price, \$1 per copy. Send your requests now to the EDITOR, "Construction Methods and Equipment," 330 W. 42nd St., New York 36, N. Y.



LARGE PHOTO—1,000,000-lb. roof slab—first inverted beam slab to be raised in this country.

SMALL PHOTOS—Top view of 1,000,000-lb. slab; also 400,000-lb. lift-slab.

Temple Isaiah, Los Angeles, Calif. Archt.—Kenneth N. Lind, A.I.A.; Struc. Engr.—Brandow & Johnston; Contr.—Zimmer Construction Co.; Sub. Contr.—Vagtborg Construction Co.; Pozzoloth Ready-Mixed Concrete supplied by Consolidated Rock Products Co.—all of Los Angeles, Calif.

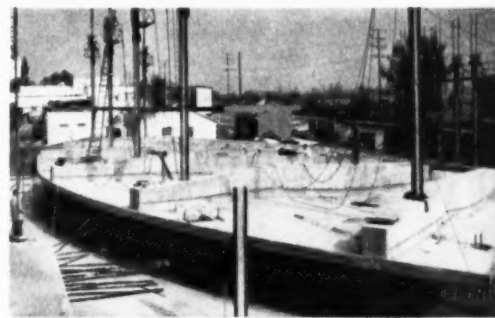
First Inverted Beam Lift-Slabs Are POZZOLITH CONCRETE

IN a letter about this job, Zimmer Construction Co., the contractor, said—"With the use of Pozzoloth in our concrete we were able to . . . pour both slab and beams together with $3\frac{1}{2}$ " slump, yet were able to maintain the necessary workability so necessary in this type of pour without excessive vibrating.

"Further, with the use of Pozzoloth we obtained a seven day test of 3,200 pounds and a twenty-eight day test of 4,600 pounds, allowing us to raise these slabs in seven days instead of the usual fourteen day delay."

Better, more economical concrete is obtained with Pozzoloth because it *reduces the unit water content* of a mix approximately 15%. As stated by the American Concrete Institute (ACI 613-44, Page 655)—"For a given set of materials and water-cement ratio, the unit water content (water required per cubic yard of concrete) is the most important basic factor affecting the quality of concrete." Obviously, for a given water-cement ratio, the mix requiring the lowest water content will also produce the most economical concrete.

Investigate the advantages of Pozzoloth for your next job . . . it will enable you to obtain the required qualities *at lower cost than by any other means*. "See-for-yourself" Pozzoloth demonstration kit supplied on request . . . without cost or obligation.



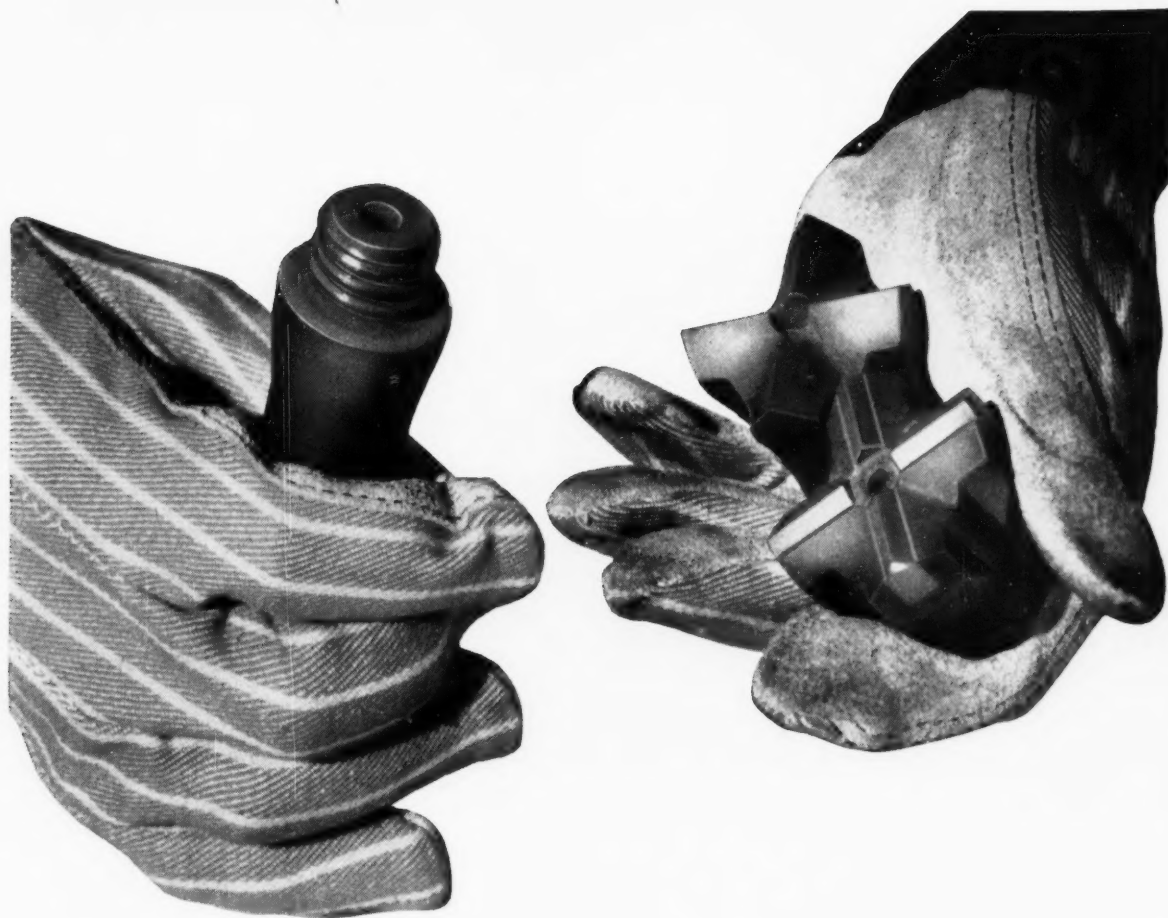
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